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Riter-Conley Manufacturing Company

STEEL CONSTRUCTION

Pittsburgh

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SMITHSONIAN DEPOSIT.

THE UNITED GAS IMPROVEMENT COMPANY,

PHILADELPHIA.

BUILDERS OF

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LOWE WATER GAS APPARATUS.

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OF

AIR AND STEAM SUPPLY

(PATENTED),

AFFORDING { **PERFECT CONTROL OF GENERATOR FIRE CONDITIONS.**

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New Office Building of the Cambridge (Mass.) Gas Light Company.

The new building of the Cambridge (Mass.) Gas Light Company, which was formally opened on the 23d ult., was built from plans prepared by Shepley, Rutan & Cooledge, of Boston. The style is Italian renaissance, and the material, a white sand stone; the building being 121 feet by 62 feet. Entering through the center archway, on the Massachusetts avenue front, one sees the main floor 81 feet by 32 feet, with a 24-foot ceiling. Back of the arches, and on mezzanine floor are the cashier's cages and the desks of the accounting department.

The office of the President is in the Temple street corner, with the Directors room, and rooms for the women employees immediately above.

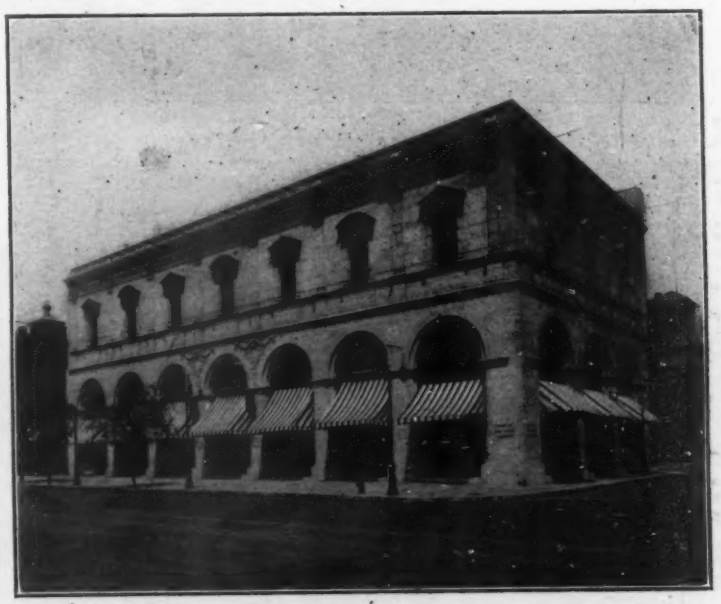

Fig. 1.

Fig. 2.—Interior Main Floor.

The service entrance is in the rear, through a paved court facing the lawn of the Y. W. C. A. building adjoining, which gives a very pleasing outlook from all the back windows, as well as abundance of light.

From the main display room, a staircase leads to the industrial appliance room in the basement. Here are the workshop, meter storage, men's lockers, showers, etc., and the heating and ventilating plants. At the south end of the main floor is a specially fitted room for displaying fixtures and glassware, under daylight or artificial light; and over this is an office for the Company's chemist, with rooms for candle power and photometric determinations. The third

Fig. 3.—Main Floor back of Arches.

Fig. 4.—President Barnes' Office.

Fig. 5.—Recreation Room for Women Employees.

floor (not at present divided) will be used as a storeroom, until required for other purposes.

The lighting throughout is by Reflex lamps, those in the front windows and on the semi-indirect bowls in the main room, having distant control. Six gas arcs, on ornamental curb standards, and two wrought iron lanterns at the main entrance, illuminate the exterior, and make the building a land mark by night as well as by day.

Sensitiveness of Selenium to Light of Different Colors.

[Prepared for the JOURNAL, by DR. L. KEENE HIRSHBERG.]

Professor A. H. Pfund, of the Physical Department, Johns Hopkins University, has discovered certain curious facts about the behavior of the sheets of selenium, called the selenium cell. The possibility of using selenium for the ordinary measurement of light has been in the minds of many; but there are certain irregularities in its behavior which set a limit to its usefulness. One obvious difficulty lies in the fact that the rays of light to which the eye is most sensitive, are not necessarily those which have the greatest effect on selenium.

Dr. Pfund brings this out by reproducing a new curve, or drawing, which shows the distribution of sensitiveness of this material throughout the spectrum of a Nernst electric light glower. The maximum intensity in this spectrum lies far out in the infra-red, while the maximum luminosity to the eye, in ordinary or moderate illuminations, is situated in the yellow-green.

The maximum sensitiveness of selenium, however, is located in the red. and the shape of the curve is also distinctly different from the luminosity curve for the eye, so that inconsistent results would evidently be obtained if one tries to compare the light from various illuminants or sources of light by means of selenium.

Selenium cells have a sphere for purely comparative measurements of one-and-the-same source of light; for example, they are used to study the fluctuations of gas light and the variation in illumination in the course of an eclipse. One of the strange facts brought out by Dr. Pfund is the dependence of the maximum sensitiveness of the selenium cell on the intensity of the stimulus. With a very bright light, the maximum is in the red; but as the illumination is lessened this maximum becomes less definite, ultimately resulting in a feeble light, and another maximum point appears in the green.

Ruhmer makes two kinds of selenium cells, a "hard" type, which is most sensitive to strong light and relatively insensitive to feeble ones, with a maximum in the red; and a "soft" type which is most sensitive to weak light, with its maximum in the green. This has caused numerous discrepancies in the results of different observers.

The most remarkable and curious discovery from Professor Pfund's researches is the fact that the behavior of the selenium cell is strangely similar to that of the human eye. It is a well authenticated truth, proved long since, that whereas, at strong illuminations, the maximum luminosity occurs in the yellow, in weak lights it shifts to the green. This is known as the Purkinje effect. In very feeble light the eye seems almost insensitive to red, while green and blues appear as an uncanny light gray. Formerly this singular effect has ascribed to a struggle for predominance between minute light organs on the retina known as rods and cones. But, according to the later theory, this is not necessarily so; for the accentuation of the red end of the spectrum, with increasing intensities of light, is characteristic of all chemical-light processes. Anyhow, the similarity between the eye and the selenium cell in this respect is very suggestive. At first sight this complicated behavior of selenium would seem unfavorable to its general use in photometry; but in a sense it seems happy, for selenium may now be prepared in such a way as to follow out exactly the behavior of the human eye, with regard to the perception of luminous energy.

[CONCLUDED FROM PAGE 75.]

PROCEEDINGS, TWELFTH MEETING, WISCONSIN GAS ASSOCIATION.

HELD IN MILWAUKEE, WIS., MAY 14 AND 15.

SECOND DAY—AFTERNOON SESSION.

The President introduced Mr. H. R. Cook, Jr. (Philadelphia), who read the following paper on

THE USE OF MOTOR VEHICLES BY GAS COMPANIES.

This paper is intended to show the value of automobiles and motor trucks in the gas business. The data is taken from the records of 23 gas companies, and covers various types of automobiles and motor trucks. The costs given in Tables Nos. 1 and 2 cover only actual operation of the machine; that is, tires and repairs, gasoline oil, general repairs, licenses, insurance, cleaning and sundries. They

TABLE 1.

Class	No. Of Cars	Average First Cost	Average Mileage To 1/1/13	Average Mileage Year 1912	Average Miles per Gallon 1912	Tires & Tire Repairs, Avg. Cost per Mile 1912	All Other Operating Charges, Avg. Cost per Mile 1912	Total Average Cost per Mile 1912	Total Average Cost per Mile To 1/1/13
A	12	$615	4,446	4,446	13.7	1.1¢	3.7¢	4.8¢	4.8¢
B	2	821	9,303	5,594	12.6	4	5.6	6.0	6.4
C	4	908	14,323	7,235	9.3	2.8	8.5	11.3	9.9
D	1	935	4,700	4,700	8.4	3	3.8	4.1	4.1
E	2	1,224	12,141	6,685	9.5	2.7	11.8	14.5	11.4
F	1	1,250	20,790	6,034	14.9	4.9	9.0	13.9	14.1
G	1	1,300	22,155	4,684	10.4	3.2	12.2	15.4	10.5
H	8	1,317	18,072	6,658	10.1	2.6	10.0	12.6	10.6
I	2	1,337	15,208	5,705	9.6	2.7	9.0	11.7	8.6
J	1	1,381	24,741	6,223	10.0	1.8	10.1	11.9	9.9
K	7	1,575	18,417	6,718	10.1	2.6	7.2	9.8	8.7
L	1	1,800	16,602	5,638	7.3	1.9	6.3	8.2	8.9

TABLE 2.

Class	No. of Trucks	Average First Cost	Average Mileage To 1/1/13	Average Mileage Year 1912	Average Miles Per Gallon 1912	Tires & Tire Repairs, Avg. Cost per Mile 1912	All Other Operating Charges, Avg. Cost per Mile 1912	Total Average Cost Per Mile 1912	Total Average Cost Per Mile To 1/1/13	Type Truck
A	4	$700	2,000	2,000	12.1	4¢	5.6¢	6.0¢	6.0¢	Light delivery 500 # capacity
B	1	1,000	2,476	2,476	6.4	0	6.7	6.7	6.7	Light delivery 750# capacity
C	1	1,050	5,054	5,054	6.8	1.8	7.7	9.5	9.5	Light delivery 1,000# capacity
D	2	775	3,194	3,194	8.4	0	5.6	5.6	5.6	1/2 Ton truck
E	9	1,580	2,456	2,456	6.8	5	7.0	7.5	7.5	1 Ton truck
F	1	2,705	7,336	7,336	8.2	0	5.1	5.1	5.1	2 Ton truck
G	1	5,000	6,898	6,378	4.1	2.4	10.7	13.1	13.1	2 Ton truck
H	1	5,100	3,479	3,479	4.3	0	10.6	10.6	10.6	2 Ton truck
I	1	5,154	1,597	1,597	2.6	0	10.2	10.2	10.2	2 Ton truck
J	1	5,499	2,577	2,577	3.0	0	13.0	13.0	13.0	5 Ton truck

exclude depreciation, interest and labor operating. Table No. 1 relates to automobiles used by managers, superintendents and foremen; and Class A. is a light runabout. All these were purchased during 1912, and the average operating cost is probably a little below what it will be during the life of the machines.

Class B. also refers to a light runabout. One of the two cars of this class was purchased in 1910, the other in 1911. It is interesting to note the average cost of operating in 1912 was less than the average for these cars since they were purchased.

Class C. has to do with four cars of a slightly higher price than Class B. One is a touring car, the other three being runabouts, all having the same chasses. Two were purchased in 1910, one in 1911, and one in 1912.

Class D. represents one runabout of approximately the same price as Class C., purchased in 1912. The costs covering this car are, therefore, somewhat below what may be expected in the future.

Class E. tells the story of two cars, considerably more expensive than those of the previous classes. Both are touring cars, purchased in 1911. From the mileage thus far obtained, it is estimated that they have been in use about one-half of their likely life.

Class F. pertains to one 4-passenger car, purchased in 1909, costing about the same as those in Class E. This car had an accident which made necessary extraordinary repairs, amounting to 1.2 cents per mile. It has been in use for almost its estimated life; and, by subtracting the 1.2 cents from the average cost of operation, to January 1, 1913, we have a very fair figure of what may be expected of a car of this type.

Class G. stands for a touring car of slightly higher price than those in Classes E. and F. It was purchased in 1909, been in use 3½ years, and has practically covered its estimated mileage. You will note that the cost for 1912 is considerably in excess of the average. Of this cost 4.4 cents may be charged to a general overhauling.

Class H. includes 8 cars, of about the same average cost as that of Class G. Six are roadsters, two are touring cars. One was purchased in 1908; one in 1909; five in 1910; and one in 1911. While the average cost of this class is not high, it is considerably higher for 1912 than the average to January 1, 1913, due to the high cost of operating the old cars. This type car was not satisfactory; for one car may make a good showing, while another may make a very poor showing.

Class I. is connected with two roadsters, one purchased in 1909, the other in 1911. The older of these cars has been sold, after covering the mileage expected of it; the other is still in use. The cost of operaring this class is considerably lower than the other classes, comparing favorably with it in first cost.

Class J. relates to a roadster, purchased in 1909, and is not of as high a grade as may now be purchased for equal money. It has made almost its estimated mileage, and still shows a fair cost per mile.

Class K. tells the story of considerably higher priced cars than those of the other classes. Of these there are seven, three touring cars and four roadsters; three were purchased in 1909, three in 1910, and one in 1911. While older than most of the others, this class is expected to cover a greater mileage, and, up to January 1, 1912, had made only about 60 per cent. of the rating. The operating cost is lower than any other class of near the same weight, but it will no doubt be increased somewhat by the time the cars reach their estimated mileage.

Class L. refers to one car, the highest priced of any in the table. It is a roadster, purchased in 1909, and, although in its fifth season, has made only about one-half the mileage expected of a car of this price. It operating cost is low, and not increasing.

A general analysis of the table shows the average cost of operating the smaller cars (as would be expected) lower than that of the heavier ones. A study of the individual cars shows that the cost of operation runs up as the car nears the end of its life; but in some cases the cost of operation during the middle of its life is lower than at first. All of the vehicles in Table 1 were purchased in 1912.

Classes A., B. and C. are light delivery wagons, used for carrying Welsbach material, fixtures and small special appliances.

Classes D. and E are light trucks, used for meter work, hauling storeroom material, and for delivering ranges, etc.

Classes F., G., H., I. and J. are heavier trucks, for hauling storeroom material, delivering ranges and water heaters; also heavy pipe for street mains.

Class F. truck has an exceedingly low cost, partly due to its being used on very good roads, and it is somewhat lower than is expected for the future.

Class G. has a high cost, largely due to hilly territory and poor roads. This truck is considered quite satisfactory, and several more have been recently purchased. Lower operating costs are expected in the future.

It may be well to describe the general method of working with these delivery wagons and motor trucks. The driver and helper on heavy trucks, when used for delivering ranges, etc., do no work on the consumers' premises. The range is delivered and placed as near its permanent location as possible, with necessary pipe, and a box of fittings. A fitter calls later and makes the connection, the truck then collecting the material left over. This means that the truck is idle a very small percentage of the time. The driver works from a route sheet, laid out by the dispatcher, so as to cover the work with a minimum mileage. The light delivery wagons, when setting meters, delivering Welsbach material, hanging fixtures, etc., are idle while the driver does the necessary work, where the job does not take more than an hour. For longer jobs, a delivery is made, and the work done by a fitter, who travels on a bicycle or street car.

Experience shows, with continued use of motor vehicles, an organization can be developed that will operate them with little expense; and where there are a number of cars, a man can be employed to make the minor repairs, at much lower cost than repair shops.

Depreciation should be figured on an estimated mileage basis, and the per mile figures are approximately as follows:

	Per Mile. Cents.
Cars in Table No. 1	5
For trucks costing less than $1,000	6
" " $1,000, but less than $1,500	7
" " $1,500, " " $2,500	8
" " $2,500, and above	9

For example, for a $1,000 car, a mileage of 20,000 miles is the estimated life.

The tables do not include the labor of driver or helper, this expense not applying to motor vehicles more than to wagons. To illustrate this, consider the following: A driver of a team or motor vehicle, when not engaged in driving, will be doing other work, not chargeable to transportation. Where two or more men are carried, the driving may be regarded as the total wages of the men while the car is moving, and the greater the number of men carried, and the higher their wages, the larger is the labor cost per mile, and the greater the saving in labor by the more swiftly moving vehicle. With a team making 3 miles per hour, and carrying two men, with total wages of 45 cents per hour, the labor cost of transportation will be 15 cents per mile. For a similar load, hauled by a motor truck, averaging 10 miles per hour, with two men, and a total wage of 50 cents per hour, the labor cost of transportation would be only 5 cents per mile. This applies to the vehicles while in motion. With motor vehicles while at rest all charges cease, except interest and storage. With horse-drawn vehicles there are these charges, and those for the feed and

care of the horse. This reasoning also applies when work is slack and there is no use for the vehicles. Detailed comparisons are made of horse-drawn vs. motor-driven vehicles of various capacities, the estimates being applicable only to the local conditions for which they were made.

The first is a comparison between a light runabout (Class A., Table No. 1) and a horse and buggy for a foreman or inspector.

The second is a comparison between a light delivery truck (Class D., Table No. 2) and a 1-horse wagon.

The third is a comparison between a light delivery wagon (Class A., Table No. 2) and a 2-horse wagon.

The fourth table is a comparison between a heavier delivery wagon (Class C., Table No. 2) and a 2-horse wagon.

The fifth table is a comparison between a 1 ton truck (Class E., Table No. 2), and a 2-horse wagon.

The sixth table is a comparison between a 2-ton truck (Class H., Table No. 2), and a 2-horse truck.

These tables, with a single exception, show an estimated operating cost in excess of the actual, and all show the motor vehicles displacing but one horse-drawn vehicle, but due to the greater speed, the motor vehicle in most cases displaces more than one horse-drawn vehicle.

Promptness in making deliveries, due to the speed of motor vehicle, results in pleased and satisfied customers, the aim of all gas companies.

For greater efficiency in supervising distribution work, the motorcycle is the cheapest and quickest, when weather conditions are favorable; but when roads are bad, from rain or snow, it is dangerous. A light runabout is not affected by these conditions, and is the ideal means of transportation, for a foreman or superintendent to keep in close touch with the work. Its value is more apparent in scattered territories, where it also permits carrying tools and light materials needed in a hurry. The following data on operation of motorcycles may be of interest:

Seventeen machines (bought 1908 and 1909) show an average operating cost of 3.3 cents per mile. Seventy-four machines (bought 1911 and 1912) show for 1912 an operating cost of 2.7 cents per mile. A fair charge for depreciation is 1.5 cents per mile, and a fair average life is 15,000 miles. They will average about 35 miles per gallon of gasoline.

Some prestige and advertisement are gained by companies using motor vehicles, but that value is hard to estimate.

TABLE 3.—*Light Runabout for Foreman and Inspector.*

Horse Hauling:		
Investment	$400	
Interest on average investment	6 per cent.	
Depreciation per year	20 "	
Average miles per year	3,000	
Average speed per hour	4	
Operating:		Per Mile.
Care of horse per year	$300.00	
Repairs equipment	30.00	
Total	$330.00	11.00c
Depreciation	12.00	.40
Interest	80.00	2.67
Labor: Foreman, 35c per hour—4 miles.	262.50	8.75
Cost per year	$684.50	22.82c
Runabout:		
Investment	$650	
Interest on average investment	6 per cent.	
Depreciation, based on estimated life of	15,000 miles.	
Average miles per year	3,000	
Average speed per hour	10	
Operating:		Per Mile.
Cost of operating	$210.00	7.00c
Interest	19.50	.65
Depreciation	130.00	4.33
Labor: Driver, 35c per hour—10 miles.	105.00	3.50
Cost per year	$464.50	15.48c

Summary.

Horse hauling	$684.50
Runabout	464.50
Saving per year	$220.00

TABLE 4.—*Light Delivery Motor Truck.*

Horse Hauling:		
Investment	$300	
Interest on average investment	6 per cent.	
Depreciation per year	20 "	
Average miles per year	3,000	
Average speed per hour	3	
Operating:		Per Mile.
Care of horse per year	$300.00	
Repairs equipment	30.00	
Total	$330.00	11.00c
Depreciation	9.00	.30
Interest	60.00	2.00
Labor: Driver, 25c per hour—3 miles.	250.00	8.33
Cost per year	$649.00	21.63
Motor Truck:		
Investment	$800	
Interest on average investment	6 per cent.	
Depreciation, based on estimated life of	15,000 miles.	
Average miles per year	3,000	
Average speed per hour	11	
Operating:		Per Mile.
Cost of operating	$240.00	8.0c
Interest	24.00	.80
Depreciation	160.00	5.33
Labor: Driver, 30c per hour—11 miles.	81.81	2.73
Cost per year	$505.81	16.86c

Summary.

Horse hauling	$649.00
Motor truck	505.81
Saving per year	$143.19

TABLE 5.—*Light Delivery Wagon.*

Horse Hauling:		
Investment	$600	
Interest on average investment	6 per cent.	
Depreciation per year	20 "	
Average miles per year	5,000	
Average speed per hour	4	
Operating:		Per Mile.
Care of horse per year	$600.00	
Repairs equipment	60.00	
Total	$660.00	13.20c
Depreciation	120.00	2.40
Interest	18.00	.36
Labor: 25c per hour—4 miles.	312.50	6.25
Cost per year	$1,110.50	22.21c
Motor Truck:		
Investment	$700	
Interest on average investment	6 per cent.	
Depreciation, based on estimated life of	20,000 miles.	
Average miles per year	5,000	
Average speed per hour	10	
Operating:		Per Mile.
Cost of operating	$400.00	8.0c
Interest	21.00	.42
Depreciation	175.00	3.50
Labor: 25c per hour—10 miles.	125.00	2.50
Cost per year	$721.00	14.42c

Summary.

Horse hauling	$1,110.50
Motor truck	721.00
Saving per year	$389.50

TABLE 6.—1,000 *Pound Capacity Delivery Wagon.*

Horse Hauling:	
Investment	$600
Interest on average investment	6 per cent,
Depreciation per year	20 "
Average miles per year	5,000
Average speed per hour	4

		Per Mile.
Operating:		
Care of horses per year	$660.00	
Repairs equipment	60.00	
Total	$660.00	13.20c
Depreciation	120.00	2.40
Interest	18.00	.36
Labor: 1 man, 25c per hour—4 miles.	312.50	6.25c
Cost per year	$1,110.50	22.21c
Motor Truck:		
Investment	$1,050	
Interest on average investment	6 per cent.	
Drepreciation, based on estimated life of	20,000 miles.	
Average miles per year	5,000	
Average speed per hour	10	
Operating:		Per Mile.
Cost of operating	$400.00	8.0c
Interest	31.50	.63
Depreciation	262.50	5.25
Labor: 1 man, 25c per hour—10 miles	125.00	2.50
Cost per year	$819.00	16.38c

Summary.

Horse hauling	$1,110.50
Motor truck	819.00
Saving per year	$291.50

TABLE 7.—*One Ton Capacity Motor Truck.*

		Per Mile.
Horse Hauling:		
Investment	$800	
Interest on average investment	6 per cent.	
Depreciation	20 "	
Average miles per year	3,000	
Average speed per hour	3	
Operating:		
Care of horses per year	$600.00	
Repairs equipment	60.00	
Total	$660.00	22.00c
Depreciation	160.00	5.33
Interest	24.00	.80
Labor: Foreman and 1 man—55c per hour—3 miles	550.00	18.33
Cost per year	$1,394.00	46.46c
Motor Truck:		
Investment	$1,500	
Interest on average investment	6 per cent.	
Depreciation, based on estimated life of	20,000 miles.	
Average miles per year	3,000	
Average speed per hour	10	
Operating:		Per Mile.
Cost of operating	$300.00	10.00c
Interest	45.00	1.50
Depreciation	225.00	7.50
Labor: Foreman and 1 man, 55c per hour—10 miles	165.00	5.50
Cost per year	$735.00	24.50c

Summary.

Horse hauling	$1,394.00
Motor truck	735.00
Saving per year	$659.00

TABLE 8.—*Two Ton Capacity Motor Truck.*

		Per Mile.
Horse Hauling:		
Investment	$800	
Interest on average investment	6 per cent.	
Depreciation per year	20 "	
Average miles per year	4,500	
Average speed per hour	3	
Operating:		
Care of horses per year	$600.00	
Repairs equipment	60.00	
Total	$660.00	14.67c
Depreciation	160.00	3.56
Interest	24.00	.53
Labor: Driver and helper, 45c per hour—3 miles	675.00	15.00
Cost per year	$1,519.00	33.76c
Motor Truck:		
Investment	$3,500	
Interest on average investment	6 per cent.	
Depreciation, based on estimated life of	40,000 miles.	
Average miles per year	4,500	
Average speed per hour	10	
Operating:		Per Mile.
Cost of operating	$675.00	15.00
Interest	105.00	2.33
Depreciation	393.75	8.75
Labor: Driver and helper, 50c per hour—10 miles	225.00	5.00
Cost per year	$1,398.75	31.08

Summary.

Horse hauling	$1,519.00
Motor truck	1,398.75
Saving per year	$120.25

Discussion.

Mr. Patten—We had a 1-ton truck operated by a fitter. In a year the truck cost twice as much as the ordinary single horse and wagon; but in another place the same make of truck replaced 4 single wagons, and did more work. I believe the man who runs the machine has much to do with the success of auto-trucking. In the place where the truck took the place of 4 wagons the man thoroughly understood the operation of the former.

Mr. Jones—We have a ¼-ton truck now in its third year. Our longest period of enforced idleness was for 2 weeks, during a severe snowstorm. Just before the busy season we overhaul, repaint and varnish it. We were fortunate enough to get the right man. He takes an interest in the truck, keeping it in good shape. The motor truck takes care of the fitters, service, main crews, and all our freight. If we can retain the present operator, the machine is good for 10 or 12 years. Should we invest in another we will get a heavier one; but we are more than pleased with our experience.

Mr. Patten—Does your truck serve the gas end alone?

Mr. Jones—Both departments.

The President—What is the effect of the increased and increasing cost of gasoline?

Mr. Cook—With a heavy truck you get approximately 10 miles to the gallon, so if gasoline goes up 10 cents your cost of operation goes up 1 cent per mile. I believe we can use by-products from our gas plants to run our machines, and so "make money on the side."

Mr. Brechtel (General Vehicle Company)—Tables B, D, H, I and J, show no tire or tire upkeep expense.

Mr. Cook—I give you the facts as collected. These trucks, purchased last year, have solid tires. Our estimates of cost per mile are higher than actual, so there is ample allowance for tire repairs.

Mr. Brechtel—We have 3 machines in service in Minneapolis that have covered between 28,000 and 31,000 miles on one set of tires; yet I don't think it right to fail to charge for wear-and-tear on tires. Solid tires are guaranteed for 12 months, and it is right to figure a new set of tires every year to arrive at your cost of operating. Our trucks are all electric. The tire manufacturers give 18 months' guaranty on electric, and 12 months' on gas cars, because their speed is uniform and governed by the motor battery.

Mr. Cook—Tables 1 and 2 give actual cost; they are not estimates.

Mr. Brechtel—The St. Paul Gas Light Company bought a 1-ton truck last May. It has covered something over 6,000 miles, at a total expense (outside of current) of 80 cents, allowing nothing for tires or renewals. Where do you include your replacements, valves and small repairs?

Mr. Cook—All are included under "All other operating charges," which includes everything except tires and tire repairs.

Mr. Brechtel—This St. Paul machine has an Edison, "A-6 battery," on which he guarantees a 4-year life with 100 per cent. efficiency. On a lead plate battery, in a single ton machine, we figure on a renewal every 12,000 miles, or about 300 cycles charge and discharge of the battery, figuring 45 to 50 miles per charge.

Mr. Irwin—I never get more than one season out of a set of batteries.

Mr. Brechtel—Users of pleasure cars as well as commercial cars have a habit of charging the batteries every little while. The life of a battery is measured by the cycles it makes, and it is policy in driving electric vehicles to get 80 per cent. of your battery capacity, and then recharge. More batteries are ruined by too frequent charging than in any other way. We sold a 3½-ton truck a year ago, on which battery renewal cost was $327, making from 8 to 12 miles a day. I found the operator was charging the battery every night, with the result that it was shot to pieces. Another machine of ours that has been in service 10 years is getting from 24 to 28 months' life, because only charged 2 or 3 times a week.

The President called for the

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS,

which was read by the Secretary as follows:

Your Committee on President's address begs to report:

The President has made a comprehensive review of the industry, touching on the points of acute interest developed during the year. It also voices the sentiment of the gas companies of the State toward the Railway Commission. It clearly points out the fact, not clearly understood by the public in general, that the product of gas companies has many active competitors. The address brings to view problems of manufacture which are confronting managers regarding changes in the cost of raw material; and the comments on distribution and selling methods are very timely. It also emphasizes the necessity of more detail accounting than is practiced by some companies, which would show where small savings could possibly be made.

Your Committee believes that the appointment of a committee to co-operate with a similar committee doing electrical business should be submitted to the Association for discussion.

F. E. CURTIS,
E. G. PRATT,
GEO. F. GOODNOW, } Committee.

The President—The idea of appointing a committee to co-operate with the committee of the Wisconsin Electrical Association was not original with me. The electrical interests have a committee that looks after their welfare at all times, and especially during the meeting of the legislature. This committee notifies the members of the Association as to bills that might affect them; and it was suggested that, by co-operating with that committee, gas companies could also be advised of matters pending that needed their attention; and the cost would be small. I thought it of enough importance and moment to warrant its bringing up and letting the Association act as it saw fit.

Mr. Haseltine—As a member of the Wisconsin Electrical Association I appreciate the value of that committee, and think it advisable that members of the Wisconsin Gas Association should have the same benefit. Numerous obnoxious bills come up every session. I accordingly move that such a committee be appointed, to co-operate with the committee of the Wisconsin Electrical Association.

Mr. Owens—When I came to La Crosse I found that our Company had not paid its dues to the Wisconsin Electrical Association, and apparently intended to resign. I made a number of inquiries and I could not determine where it was going to be worth to us $100 a year. This question of association membership is worthy of a great deal of thought. It is unfortunate that the electrical association connection costs $100, and the Gas Association only $3 a year. Something is the matter somewhere in this instance. However, I am told that your Gas Association does five times much good for the gas industry as the electrical association does for the industry it represents. In New York State an association, with dues of 1/20 of 1 per cent., covers both gas and electric companies, and their interests, as far as legislation is concerned. If any one can give me a reason why we should continue the membership at $100 a year in order to have a representative at Madison, I would appreciate it.

Mr. Phenicie—As a member of the Wisconsin Electrical Association I feel that the Association has done the electrical utilities of the State a great deal of good, by following up the wild cat legislation proposed at Madison, by doing what they can to enlighten the members of the Legislature on the effects of these freak bills. The membership does not comprise all the electric utilities in the State, and necessarily the expense is great. I forget the percentage of the tax, but it seems to me it is about 1/20 of 1 per cent. If we could get all the electric and gas utilities to join, certainly that tax would come down. Personally I heartily indorse the sentiment that we get together for the purpose of defeating freak and dishonest legislation, and for other purposes. We can do a world of good at a minimum expense.

Mr. Haseltine—The Electrical Association has cost us more money than the Gas Association, but it does a great work. It is pretty hard to find out what some bills mean, and if we did not have a committee there we might be very sorry. Last night a speaker at the banquet mentioned an iniquitous measure of which I had not heard; but it is probably a bill the electrical companies were not interested in or we would have been notified. It seems to me the Gas Association should do its share in this.

On motion the matter was referred to the Executive Committee, with power to act.

THE DOUGLAS MEMORIAL.

The President—We will now hear the report of committee to draft resolutions on the death of Mr. David Douglas.

MILWAUKEE, WIS., May 15, 1913.

With a feeling of profound respect and sorrow we pause, in our deliberations, to express our great regret in the loss of our fellow member, Mr. David Douglas, of Eau Claire. In the passing of our beloved ex-President, this Association suffers a great loss, since Mr. Douglas (born and raised in the gas industry) was always foremost in all efforts for the betterment of the gas business, and for the promotion of the best interests of our Association work.

Our older members, in particular, feel a sense of great personal loss, and this Association, as a body, earnestly expresses to Mr. Douglas's family, and in particular, to Mrs. Douglas, its deep sense of loss and extends its heartfelt sympathy.

We recommend that these sentiments be spread upon the records of our Association, and that a copy be transmitted to the family of our deceased associate and friend. Respectfully submitted,

W. JONES,
EDMUND S. DICKEY,
R. O. JASPERSON, } Committee.

On motion (adopted by standing vote) the report was accepted and ordered spread on the minutes.

The President, before putting a motion to adjourn, expressed his obligation to the members for the hearty support that they had given him, and congratulated them on the successful sessions which had been maintained by their attention.

FIFTH ANNUAL MEETING, SOUTHERN GAS ASSOCIATION.

HELD IN SELWYN HOTEL, CHARLOTTE, N. C., APRIL, 1913.

FIRST DAY.—MORNING SESSION.

President White, having called for order, introduced Mayor Bland, who delivered this address of welcome:

Mr. President and Gentlemen: I wish, first, to confess ignorance of any knowledge of gas. Although I am somewhat of a politician, I really know little about it. I am told it was first introduced (1792) in England by a Mr. Murdock, whose conveying of it through a pipe 70 feet long, was considered a wonderful thing then. Even unto the present time it is one of the wonders of the age. Going to a small town in this State, after enjoying the beauties of the scenery, and seeing the majestic mountains that surrounded, I finally saw the sun set in all his glory. As I watched the shadows cross the little village, a great silence came. You could almost hear the stir of an insect's wing, then came impenetrable darkness. One could hear the owl's hoot and the cricket's cry, and the plaintive drone of the whippoorwill from the mountain. It was so oppressive that I was close even to foreboding—I never did like darkness, even as a small boy. Going back a few years afterwards to that village, they had a crude gas arrangement for lighting it. Once again I saw the sun set and the shadows fall, then the lights came twinkling, one at a time, and the strains from a phonograph swelled on the air to the tune of "Casey Jones." Now I felt that I was living in a great century; that I was living in a town where we could cook with gas. I assure you, gentlemen, you are doing a great work for humanity in lessening the labors of the housewife, and in the illuminating of our cities. At this, your fifth annual meeting, I extend to you a hearty, cordial welcome. Let me assure you there are no keys to the city of

Charlotte. Its doors are open; and, gentlemen, you have but to say the word. I will do anything I can. I extend to you all a most hearty and cordial welcome. [Applause.]

RESPONSE OF MR. HOYT.

Mr. Hoyt (Jacksonville, Fla.), in responding to the Mayor, said: Mr. Chairman, Citizens of Charlotte, Gentlemen—It is a pleasure to be here this morning and, as a representative of the Southern Gas Association, to acknowledge this pleasing welcome, which is accepted with the same sincerity and truth that we know you put into your welcome. We have all heard of this splendid Piedmont plateau, although many of us are visiting it for the first time. We have heard of Charlotte, glorified by the historical recollections of the past, animated by the progressiveness of the present. We have heard of your resources and your commerce in cotton and varied agricultural products. We have heard of your educational institutions, of the culture of your citizens, and of the glories of your hospitality, exceeded only by the beauty of your women. This week we propose to get better acquainted with all these things, for we are here to investigate these resources, these attractions. As a small boy my heart swelled with pride at the mention of the Declaration of Independence, proclaimed from the city of Philadelphia, that memorable fourth day of July, 1776; and, as a boy, my heart also gained in its pulsation when I heard of that earlier declaration of independence, the Mecklenburg resolutions proclaimed in Charlotte, 14 months before Thomas Jefferson penned his famous document. We, here as Southern gas men, are proud that we are of the South, for we believe no other section of our country offers more opportunities in latent and undeveloped resources than does the South. We believe that South spells opportunity, and we believe it offers more in the way of health, wealth and happiness, than any other section in any other country on the face of the earth. And we are proud to be gas men, because we are proud of an industry, which is one of the important ones of our country. It has shown and is showing progress, backed by a record of splendid achievement. It is one of the few industries instancing constant and notable increase in efficiency, and, at the same time a constant and a notable decrease in the price of its commodity; and the latter in the face of constant and marked advances in the price of raw material and labor going with its manufacture, distribution and sale. It is an industry with the highest business ethics, that apply not only to the big things and to the generalities, but to the smallest detail of everyday work. Gas companies were among the first to realize and appreciate that the franchises granted them conferred right and privilege, to make and market a utility, a necessity of life; and that the franchise, as it granted a privilege, imposed both obligation and duty to supply that necessity in quality, quantity and pressure satisfactory and suitable, at a price fair and equitable, and under terms and conditions that are straightforward and free from arbitrary exactions. Gas companies everywhere have been leaders in development. They believe in the success of their cities, and work for the success thereof. They have, as a rule, proved profitable to the capital invested therein, which is a creditable fact, in that companies, men and managers recognized the principle that "He profits most who serves best." We are here, as the Southern Gas Association in convention assembled, with the purpose of exchanging ideas through the medium of papers, and to discuss important questions. Let us remember that we are here to enjoy and benefit ourselves, that we may thereby benefit our companies and communities in which we live. We thank you, Mr. Mayor, for your welcome, and we know that we will go away feeling that Charlotte is all that we have heard her to be. [Applause.]

On motion, the minutes of the last meeting were approved as printed, and the roll call was dispensed with.

The Secretary then read the

REPORT OF THE EXECUTIVE COMMITTEE.

CHARLOTTE, N. C., April 16, 1913.

The Executive Committee met with those named present: Messrs. H. B. Hoyt (Past President), C. E. White (President), Jas. Ferrier, S. E. De Frese, E. D. Brewer (Treas. and Sec.), S. W. Brown and M. A. Bowlin. Applications for membership were thus made: Active, 21; associate, 10.

These papers were received and authorized to be read:

"Practical Ventilation," by Mr. MacD. Dexter.
"Selling Domestic Appliances," by Mr. G. W. Howsmon.
"Industrial Appliance Campaign," by Mr. B. F. Noble."
"Management of Medium Size Gas Properties," by Mr. H. H. Carr.
"The New Coal Gas Plant at Atlanta, Ga.," by Mr. R. C. Congdon.

The following were appointed as Nominating Committee: Messrs. R. C. Congdon (Chairman), H. Collins, M. T. Walker, MacD. Dexter, G. M. Howsmon.

A Committee on Publication of Proceedings, to be composed of the retiring President (Mr. C. E. White and the incoming officers) was named. The resignations of 7 members were accepted; and it was voted unanimously to favor the election of Mr. Thos. D. Miller to honorary membership.

The President asked the wish of the members in respect to the report, and it was (on motion of Mr. Ferrier) accepted. A motion to ratify the recommendation to election to membership was carried, and the ballot of the Secretary was cast therefor. On motion of Mr. Ferrier, the Secretary cast a ballot for placing the name of Mr. Thos D. Miller on the honorary membership roll, Mr. Ferrier remarking that Mr. Miller was one of the parents of the Southern Gas Association, and only resigned as such because he had moved from the territory limiting membership. The speaker declared that Mr. Miller was duly entitled to this mark of their appreciation of his ability as a gas engineer, and also for what he had done for the Southern Gas Association. [Seconded, put and carried, amidst applause.]

Mr. Ferrier assumed the chair, and President White delivered the following

INAUGURAL ADDRESS.

There is no record of the first President's address before a gas association, but it is a time-honored custom for the President to give a resume of the business, and to look forward into the future, making suggestions for increasing our business and bettering our conditions.

It has probably occurred to some that we have too many Associations; but this criticism cannot apply to the Southern Gas Association. With our large negro population, the long distances between our large cities, and many small towns with thinly settled suburbs, I believe there is need for our Association. The members can get together, at least annually, for an interchange of ideas and opinions, with a view of bringing about a betterment of results in the properties they represent, by increased efficiency of operation and new business methods. This meeting necessitated a long journey for some of our members, but we desired to show to to the northern tier of States represented in the Association, our interest in their welfare. Charlotte is no mean city, with its population of 50,000, large industries, beautiful surrounding country, and an active, energetic public service corporation, whose interests are bound up with that of the city; excellent hotels and clubs; in fact, everything that goes to make a thriving city. Its well paved streets reflect the liberal amount spent on them. It has an energetic commercial organization, by whose efforts much is being done to develop the researches of the community. Its new and old school buildings well indicate that it recognizes that development of the mind means better citizenship. In these days of changing labor conditions we must consider new methods of manufacture to a greater extent than ever before, and we are to have a paper on this important matter. We should be alive to the new methods of gas lighting, having in mind the better design of fixtures and their installatian under proper conditions, with a view both to economy in operation and beauty of arrangement. Those of us who attended the meeting of the National Commercial Gas Association at Atlanta could not help but be impressed by the beautiful gas illumination there shown. I believe, though, that we are not getting sufficient returns from our residuals. The market is limited, and it is well for us to consider how much we are responsible for this limitation. We should broaden the market by every means in our power by using the products made from our residuals. Encourage the use of tar for road making, roofing, paints and other purposes, so that where it is used for one purpose now it may be used for ten. It is not possible for the smaller companies to construct plants for working up their tar products, but a closer community of interest should grow up between the tar products manufacturing companies and the gas companies, so that the gas companies may receive a larger return for this by-product.

In the Southern States, where more fertilizer is used per capita than in other sections of the United States, we should certainly be able to dispose of our ammoniacal liquor at an increased profit. Coke is a clean and low-priced fuel, when its many advantages are considered. We should increase our sales of coke by careful preparation and delivery, and demonstration where necessary. Encourage its use along lines where it is not now even considered. Coke of proper size makes an excellent and clean fuel for grate fires, and it is up to the gas companies to increase its consumption. Owing to the mild winter

(*Continued on page* 90.)

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NOTICE TO ADVERTISERS.

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NEW YORK, MONDAY, AUGUST 11, 1913.

[Official Notice.]

Committee Appointments, Illinois Gas Association.

Illinois Gas Association,
Office of Secretary,
Oak Park, Ills., August 2, 1913.

To the Members, Illinois Gas Association: At a recent meeting of our Board of Directors, the following appointments were made:

Technical Committee.—Messrs. R. B. Harper (Chairman), F. W. Reimers and C. C. Hotchkiss.

Public Relations Committee.—W. F. Barrett (Chairman), J. H. Eustace, R. S. Wallace, H. L. Rice and E. G. Schmidt.

Entertainment Committee.—J. E. J. Mayer (Chairman), W. F. Yardley and C. E. Reinecker.

Nominating Committee.—Messrs. H. O. Channon (Chairman), C. B. Strohn and C. L. Day.

Committee on Affiliation.—Messrs. H. L. Rice (Chairman), F. W. Bedard and W. F. Barrett.

It is hoped and desired that the members of the Association will assist these Committees in every way possible. A copy of the 1913 Directory was mailed to each member on June 3d. The bound "Volume of the Proceedings," will be distributed August 1st, to members who are not delinquent. Yours respectfully,

Horace H. Clark, Secy.

Official Notification, Technical Committee, Illinois Gas Association.

Office of Technical Committee,
Illinois Gas Association,
2501 Salt Street, Chicago.

To the Members, Illinois Gas Association: We are living in an age of ever-changing conditions—the perfected machine of yesterday; the scrap pile of to-day. Inventions, conceived and developed (almost literally) over night have revolutionized whole industries and affected thousands of workers. The scientific toy or curiosity of to-day may be the germ of the finished process or marvelous industry of to-morrow. Examples, familiar to all, are too numerous to cite. The gas industry is no exception. Practically only a century old, this wonderful business has undergone many astonishing changes and improvements. As to its status in another century, or perhaps, in but a few years, we can only speculate. It all depends on the men now actively engaged in its interest. Without action the gas fraternity must inevitably decline. With concerted action the benefits that all concerned will enjoy would be hard to estimate. Therefore, let our watchword be "Co-operation" in order that we, individually, together with our customers, may be mutually benefited. Let the Technical Committee have your ideas, not only as to what sort of subjects you would like presented at our next meeting, but also as to what you personally would present that would be of mutual interest and value. Act now before this letter is laid aside, as the time before our next meeting will pass quickly enough. Remember, you must make our next meeting the best. A generous and hearty response will be appreciated.

R. B. Harper (Chairman),
F. W. Reimers,
C. C. Hotchkiss,
Technical Committee.

BRIEFLY TOLD.

Obituary Note, Augustus Godin Guerard.—Death ended, the night of the 16th, the temporal time of a highly esteemed member of the fraternity, when the fateful summons was served on Mr. Augustus Godin Guerard, for almost a quarter century President of the Savannah (Ga.) Gas Company. It is a peculiar coincidence that the day of his death was also the day that marked his birth just 79 years ago. He was born in Savannah, July 16th, 1834, and at the outbreak of the Civil War, having returned to Savannah, from a protracted visit to Bristol, Pa., at once enlisted in the famous troop known as the Georgia Hussars, which body was well affiliated with General Joe Wheeler's renowned cavalry brigade. At the termination of the war, Mr. Guerard was paroled, following the surrender (Greensboro, N. C.) of Johnston's division. The war at an end, deceased returned to his native city, and in 1866 became connected with the Savannah Gas Company, and speedily advanced to an important place in its councils. About 1870 he was elected President of the corporation, and served it faithfully and successfully until the property was merged with that of the Mutual Gas Company, and eventually came under the control of the United Gas Improvement Company. When this occurred (or shortly thereafter), Mr. Guerard retired from active business, to enjoy in best Southern fashion the competence that came to him from his parents, and as the result of his own business qualifications; much of this time was spent in his beautiful home at Isle of Hope. Besides his gas interests, Mr. Guerard was largely interested in the railroads of Georgia, particularly so in the instance of the Augusta and Savannah Railroad, of which corporation he had been Treasurer and Secretary for a long period, and on the Directorate of which he served to the end. He is survived by Mrs. Guerard, a son and a daughter; also a sister. He was buried from his late home, 114 Park avenue, the afternoon of the 17th ult., the Rev. Mr. Rich, of St. John's Episcopal Church, conducting. The correspondent, to whom we are indebted for the main points in this narrative, thus concludes: "His friends in Savannah and throughout the State were many. His disposition was such as to win him many close and intimate associates, and he was one of the best known figures on Bay street, where for many years he had an office. His long life in Savannah had endeared him to a large number of people, who will regret to hear of his death. The end was not unexpected, as his condition had been such for several months as to leave little chance for his recovery."

Anent the Pittsburgh Meeting, Illuminating Engineering Society.—We are indebted to Mr. J. C. McQuiston, Chairman of the Advertising and Publicity Committees, for the news that the Papers' Committee of the Illuminating Engineering Society announces the following additional papers have been secured for the seventh annual convention, to be held in Pittsburgh, September 22d to 26th: Mr. W. A. Darragh, Westinghouse Electric and Mfg. Co., "Some Theoretical Considerations of Light Production;" Mr. Armine, Harrison Laboratory, General Electric Co., "Conduction Losses in Series Mazda Lamps;" Mr. R. B. Ely, of the Philadelphia (Pa.) Electric Co., "Church Lighting;" Messrs. Flexner and Dickey, Commonwealth Electric Co., Chicago, Ills., "Factory Lighting;" Mr. S. G. Hibben, Macbeth-Evans Glass Co., Pittsburgh, Pa., "Modern Practice in Street Railway Illumination;" Mr. Kilmer, of the H. W. Johns-Manville Co., "Hospital Lighting;" Mr G. M. J. MacKay, Research Laboratory, General Electric Co., Schenectady, N. Y., "The Use of Nitrogen at Low Pressures in Tungsten Lamps;" Mr. S. L. E. Rose, General Electric Co., Schenectady, N. Y., "The Illuminating Engineering Laboratory, General Electric Company, Schenectady;" Mr. H. B. Wheeler, National X-Ray Reflector Co., Chicago, Ills., "Window Lighting." It is also expected that the following papers will be presented: "Store Lighting," by Messrs. Law and Powell—this paper is to be a continuation of the subject presented by them at the convention at Niagara Falls last year; "Some Commercial Aspects of Gas Lighting," by Mr. Witte (Fall River, Mass.), and Mr. Philbrick (York, Pa.) Dr. C. E. Ferres, of Bryn Mawr (Pa.) College, will narrate the continuation of his work on tests for the efficiency of the eye under different systems of illumination. "Some of the

Physiological Aspects of Illumination" is a topic to be treated by Dr. F. Park Lewis, Buffalo, N. Y. Two papers, from the engineering department, National Electric Lamp Association, Cleveland, O., on "Errors of Photometric Measurements," and "The New Commercial Fields Opened by Recent Developments in Lamp Manufacture." Also paper by Mr. G. E. Williamson, Denver (Col.) Gas and Electric Light Co., on "Spectacular Lighting During the Knights Templar Conclave in Denver." A lecture, on the "Development of Alternating Current Luminous Arc Lamps," will be delivered by Dr. Charles Proteus Steinmetz, Schenectady, N. Y. During the week beginning September 22d, there will be held in Pittsburgh a meeting of the American Mine Safety Association, devoted, as its name indicates, to the promotion of safety in mines. The Bureau of Mines, located in Pittsburgh, will conduct, during the sessions of this Association, several interesting experiments in mine explosions. These experiments, besides being very spectacular, are of particular value in the work of the Bureau, and will afford an excellent opportunity for those interested in the illumination of mines to investigate this phase of the subject under actual operating conditions.

ANNUAL OUTING, EMPLOYEES BRONX GAS AND ELECTRIC COMPANY.—July 27th proved to be just what the "Committee on Arrangements" had ordered; a cool day with lots of sun. The starting point was the boat-landing, Clason Point Park. The time for starting was 8:30 A.M., and that hour saw a good majority of the boys on hand. In a few minutes the boat that was to carry us to our destination (the Valley Grove) "hoved in sight," and bore the appropriate title of "The Only One." Quickly all hands were on board, refreshments were iced up and the order was given to "cut loose," but the Committee was informed that Mr. Murman, of Mt. Vernon, was on his way to join us. However, due to the lateness, we "chugged off," out the Sound, a gay bunch of hard workers, off for a day's outing. The trip to Valley Grove was all one could ask for; a comfortable boat (roomy and of good speed) with the ever-changing scenery of the picturesque shore of Long Island to attract the eye. Our able Committee had hired a couple of minstrel singers, with their stringed instruments, to fill up the gaps, which they most tunefully did. On arriving at our destination, some of the boys took a swim, then all hands gathered around the festive board for a regular shore dinner, which surely went to the spot. After dinner we were photographed *en masse*, following which was a ball game contested between the married men and the single men. We can't begin to describe that contest; but it was a game. Pitchers pitched their arms off; fielders ran themselves out; and the umpire was so partial that a substitute had to be put in to please the single fellows. The result of the game was seven to six, yet no one seems to know who won the match. During and after the game some of the crowd enjoyed walks into the surrounding country, while a few of the boys tried dancing. A 'phone call told us Mr. Murman was coming. We waited for him this time, admiring his effort to be with us, and his presence was enjoyed by all on the home trip. The start for home was on about 5 o'clock P.M., and we reached Clason Point some 3 hours later as orderly a "bunch of boys" as you would wish to see. We might say our genial President, Mr. Rosenquest, and that "Prince of Mixers," Mr. Butler, were very conspicuous in all our doings. Our Committee (Messrs. Ferdon and Von Dwingelo) certainly set a standard for outings that will be hard to beat.—W. A. R.

CURRENT MENTION.—

MR. SAMUEL C. SHAFFNER has resigned as Operating Engineer for the American Public Utilities Company to accept a position with an engineering and operating corporation. He has been succeeded by Mr. B. T. Gifford, formerly with the American District Steam Company, as Chief Engineer, and with Mr. S. W. Cheeney, formerly Superintendent of the La Crosse (Wis.) Gas and Electric Company, as Assistant Superintendent. While we regret that the big-statured (if we may coin the word in this application), wholesome-hearted, highly-cultured Southerner seems gradually getting away from the gas ranks, nevertheless wherever he goes we hope good luck accompanies him.

THE United States Patent Office has notified Mr. A. S. B. Little, of Nashville, Tenn., that his application for a patent (filed October, 1912) has been examined and allowed. The patent has to do with a paint composition and process for making the same. It was designed principally for use in gas works, and the composition will be made and sold by the Atlas Paint Company, under the distinctive trade name of "At-Var-Lan."

MR. R. J. RITCHIE, General Manager of the Peoples Gas Company, of Shenandoah, Ia., reports that business with that corporation is pronouncedly on the boom. In proof whereof we have only to note that, during June and July, the occupants of 312 homes in Shenandoah signed contracts to have gas laid on to their premises. In the months named 9 miles of pipe were added to the existing distribution system, 225 gas ranges were put in service, and the Humphrey, Welsbach and other modern types of lamps set in went into the hundreds. Meanwhile it may also be reported that there was a great run on hot water generators, and several houses that had not been piped for gas were fixed up to permit such use. In fact, the only disturbing feature in the situation was the difficulty experienced in getting on the job a satisfactory staff of gasfitters, plumbers and helpers.

THE concrete garage, storeroom and machinery room of the Public Service Construction Company's new works at San Juan, Porto Rico, are finished; the ½ million cubic foot capacity storage holder will be completed in 60 days; the Gas Machinery Company's bench construction will be completed in October; and gas will be laid on by November 15th. Eleven miles of mains have been buried, 500 services have been hooked up, and 3,800 applications for gas ranges are on the Company's books, the lists for which were opened the 25th of June. President J. Alex. Mayers sends his compliments and best wishes to his confreres; and although his letter is a personal one, with the accompanying injunction that it was not for publication in any sense, we cannot forbear quoting this sentence from the communication: "I wish I had you all here to show what a beautiful country this is. It is absolutely different from anything that you New Yorkers are accustomed to enjoying."

IN the suit of Bowditch *vs.* the City of Boston and the Brookline (Mass.) Gas Light Company, who asked for damages to the amount of $5,000 for the destruction of flowers and plants in greenhouses on Georgia and Warren Streets, Roxbury, through the effects of gas escaping from a broken street main, was given a verdict of $1,800 against each of the impleaded. It was shown that the break was occasioned by the negligence of the city's men, who were laying a sewer through Warren street; and both defendants were held equally culpable.

THE reduction in selling rates at Tampa, Fla., had this effect in the week following the publishing of the new schedules: The placing of 47 new, square ranges; 18 new cabinet ranges; 7 gas water heaters; 30 gas arcs, and 83 additional meters. Pretty good work, Eh! What?"

OVER 4,000 people witnessed the baseball game (Ebbets' Field, Brooklyn, N. Y.) the afternoon of the 2d inst., between the respective teams of the Progress Club (Brooklyn Union Gas Company) and of the United Gas Improvement Company, Philadelphia headquarters. There was only one team in it at the end; and that team was the Quaker City aggregation, who scored 9 runs to Brooklyn's 3.

THE proprietors of the Pittsfield (Mass.) Coal Gas Company have announced that, from January 1, 1914, the general net rate will rule at $1 per 1,000 cubic feet. The existing schedule calls for $1.08 per 1,000.

NOTE that the below-named action of the Director of the Philadelphia (Pa.) United States Mint is taken with a view to "reducing the operating expenses:" The United States Mint in Philadelphia will use gas for fuel, instead of oil. Service mains have been laid, and the service will be commenced the 1st prox. It will require 20 millions cubic feet of gas to melt the bullion composing the coinage. Prior to the change oil was used, and 240,000 gallons per year were required for the purpose.

THE shareholders of the Detroit and Suburban Gas Company have voted to sell their franchises and other actual plant and properties to the Detroit City Gas Company.

THE Keene (N. H.) Gas and Electric Company heads the list of the taxpayers poll in that city. This year its contribution to the city treasury amounted to $843.87.

AT the annual meeting of the shareholders in the Woburn (Mass.) Gas Company, the reports submitted showed that the twelvemonth, closed the first inst., was the most prosperous one in the history of the corporation. The annual election resulted as follows: Directors, Frank H. Monks, Livingston Cushing, Jno. W. Johnson, David P. Kimball and Wm. Beggs—the latter succeeds Mr. George H. Monks, resigned. In connection with this corporation it may be noted that it has agreed to supply the large plant of the Merrimac Chemical Company with gas, which agreement necessitates the laying of a new conveying main through Merrimac street from Williams Court to the works.

THE Street Lighting Committe of Madison (Wis.) City Councils has unanimously recommended that the next contract for the public lighting of Madison shall be on the basis of an all-night and every night schedule. So, it looks that Madison is to shake off the last sign of provincialism.

THE plans for the new generating plant of the Columbia Gas and and Electric Company, on Front street, between John and Smith streets, Cincinnati, are in the hands of Messrs. Sargent & Lundy, who, of course, are being assisted by the engineering force of A. B. Leach & Co., of New York.

THE Walden (N. Y.) Village Trustees have rescinded the gas franchise rights granted some months ago to Messrs. John H. Findlay and Benjamin McDonald, under which the latter were to supply gas from Goshen to and through the districts intervening between Walden and Goshen.

(Continued from page 87.)

just past, some companies may have an excess of coke on hand, but it is up to them to increase local sales. I recommend the appointment of a residual committee, to gather statistics as to the uses of tar, coke and ammonia; to study conditions in the South and elsewhere, with a view of increasing our returns from these by-products.

Our business has been free from labor troubles of a serious nature, but we must be constantly alert, working together in anything that comes up to affect the properties we represent; and member companies should feel free to call upon any other member for advice and suggestions. I mention this, because only by working more closely together, and by more intimate relationship between member and member, can we fully realize the worth of the Association.

The negro populations of our cities and towns make a perplexing proposition. They are in many places the greater part of the population. They are in the homes of our consumers, and the more intelligent use they make of that product the better is our consumer satisfied. Therefore, the gas companies must carefully consider the education of the negro in the use of gas, both in the white man's home and in his own. These people must use some form of fuel for light and heat, and we are missing an outlet for gas by our seeming indifference to them. Many companies hesitate to go very far into this problem, because of lack of definite information as to results obtained by others. I, therefore, suggest that a committee be appointed to collect data as to what our member companies are doing in selling gas to these people. The Southern gas man has many burdens which do not come to the man in the North, and this negro proposition is one of them; but let us see if we cannot turn to a profit those things which now seem to be a loss, or at least give but small returns.

We are pleased to note an increase of membership in our Association, but believe there is still room for others. We frequently hear of the marvelous growth of the electrical business. Has not this been due very largely to the publicity given electricity and its many uses? For many years we have heard, and even at the present time we hear, that the electrical industry is only in its infancy; and after all these years of development they have organized "The Society for Electrical Development, Inc." Large sums of money are to be expended in a publicity campaign. Why are not gas companies as active in exploiting their product as are the electrical people? Why should we not find many more uses for gas? Have we reached the limit of uses for gas? I for one do not believe we have. It is certainly the cleanest fuel, and, when we consider the cost of the installation of the appliances, together with the small volume of gas used compared to the benefits obtained, there should be no difficulty in exploiting further uses for gas.

COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. Ferrier said they had listened to a very interesting and instructive address, and as it was usual that the address be referred to a committee for consideration and report, he would entertain a motion to such effect. The motion having been made and carried, Messrs. Congdon, Dickey and Dexter were appointed to so serve.

The President resumed the chair, and appointed these

COMMITTEES ON OBITUARIES.

On Linton Memorial—Messrs. Carr, Sligo and Clay.
On Smith Memorial—Messrs. Hoyt, Walker and Howsmon.

As a

COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

Messrs. Hoyt, Walker and Howsmon were designated.

The Secretary (at the suggestion of the President) read a letter from Mr. W. R. Addicks (American Gas Institute), and also an invitation from the

MANAGERS OF THE PAN-PACIFIC EXPOSITION,

to have the Southern Association hold its annual meeting (1915) in San Francisco. Having read the aforesaid letters, on motion of Mr. Howsmon, Mr. C. E. White was named to represent the Association at the Congress, and the President returned his thanks for the honor conferred.

The Secretary then read a number of

LETTERS AND TELEGRAMS OF REGRET,

expressing the best wishes of the writers for a successful meeting, and regretting inability to attend it. The signers included Messrs. J. Taylor, A. B. Patterson, L. J. Davis and J. F. Parker.

(To be Continued.)

Manufacture of Calcium Carbide.

The *Jour. Soc. Chem. Industry* notes that commercial manufacture of calcium carbide started in the early eighties, and, by progressive development, has risen to be a consumer of electrical energy greater than any other electric furnace process. As with all new industries, the beginnings were crude and inefficient. At present, although the proposition presents problems of some magnitude, the average of excellence is high, and numerous works are operated successfully from a commercial standpoint. The increased demand for carbide resulted in increased size of furnaces, and the electrical transformers necessary to their operation, and manufacturers of electrical apparatus have been forced to build generators and transformers specially adapted to the need of electrical smelting.

The raw materials used in the manufacture of calcium carbide are lime, and some form of carbon, such as anthracite coal or coke. Both these materials should be as pure as possible, and specially free from phosphorus. Sulphur, magnesia, silica, iron and alumina should be present in small quantities only.

Phosphorus occurs as calcium phosphate, which is reduced at the temperature of the electric arc, in the presence of carbon, to calcium phosphide, which, in contact with water, gives off phosphoreted hydrogen. This gas mixes with the acetylene generated, and when burners are lighted, causes a haze of phosphorus pentoxide, which is very objectionable. So carefully, however, are the raw materials selected, that commercial carbides are practically free from phosphorus, the average content of phosphine in acetylene being less than 0.002 per cent. by volume.

Sulphur, unless with considerable amounts of alumina, has little influence in the carbide. Calcium sulphide formed in the furnace by the reduction of calcium sulphate, does not decompose in water. In the presence of alumina, aluminum sulphide may be formed; this yields hydrogen sulphide when brought into contact with water. Practically speaking, very little trouble is experienced with sulphur, inasmuch as the lime and coal used rarely contain a prohibitive quantity.

Magnesia has the peculiar property of interfering with the formation of calcium carbide in the furnace. If more than 1 per cent. be present in the lime and coal, the electrical energy required becomes noticeably so much greater, that such raw material is considered unfit for use. To counteract its effect a flux of fluorspar has been recommended by some authorities, but, in the experience of the writer, this is not very successful. It is well known that magnesia mixed with carbon, and treated in the electric furnace, will not form a carbide, and is highly infusible, even at the highest temperatures obtainable. Metallic magnesium heated in a current of acetylene, however, readily forms magnesium carbide.

Barium and strontium form carbides with ease when their oxides or carbonates are reduced with carbon at electric furnace temperatures.

Silica, iron oxides and alumina form silicates, aluminates, and ferro-silicon, which reduce the purity of the carbide, and its output from the furnaces.

The presence of water, either in the free state in the coal, or combined as hydroxide in the lime, is the greatest difficulty the carbide maker has to contend with, as it reduces the furnace output more than any other factor. For this reason, the coal is thoroughly dried, usually in a rotary coal or gas fired dryer, and the lime should be burned in kilns at the carbide works, and fed direct to the electric furnace, to secure the best results.

In preparing the charge for the furnaces, the lime is crushed to pieces of 1 inch size, and the coal to above pea size. They are then roughly mixed in the theoretical proportions called for, by the equation, $CaO + 3C = CaC_2 + CO$, or approximately 100 parts by weight of the lime contents of the lime, to 65 parts of the carbon contents of the coal or coke.

In the early history of the industry it was believed necessary that both the lime and the coal should be ground very fine, and thoroughly mixed, in order to secure uniform results in the quality of the carbide. This fine grinding caused the furnace to blow out large quantities of dust, which upset the proportions of the mixture, and produced very irregular results. With experience in operation, and with furnaces of increased size, fine grinding was abandoned, until at the present time lime as large as eggs is used in some furnaces; the coal, however, is kept about ¼-inch mesh. In this way the dust losses are decreased and the actual output and quality of the carbide improved. In other electric furnace processes similar changes have

been effected, and the prevailing practice is to use coarsely ground, raw material, which offers little resistance to the free escape of the furnace gases.

Electric furnaces for the manufacture of carbide are divided into two types: The ingot furnace, in which the carbide is allowed to solidify, and the tapping furnace, in which the product is run off in a molten state. At first, carbide was made entirely in ingot furnaces, on account of the difficulty of attaining a temperature sufficient to melt it thoroughly. The simplest form of ingot furnace is the Borchers, or pot, furnace, in which an iron crucible is lined on the bottom with a layer of carbon, this being connected to one side of the electrical circuit. The other terminal of the circuit is connected to a carbon rod suspended vertically in the center of the crucible, and adjustable up and down within it. To start such a furnace, the moving electrode is lowered to contact with the carbon bottom forming an arc; the mixture of lime and coal, previously prepared is fed in around the arc and entirely covering it. An ammeter in the circuit indicates the current used, and the electrode is raised or lowered, often by automatic relays, to keep the current at a constant figure.

The early Willson furnaces used a current of 2,000 amperes and 75 volts. The arc so started in the charge smelts a pool of carbide, which gradually deepens, necessitating frequent lifting of the electrode, until the crucible is full. The crucible is then wheeled out, and an empty one substituted. When sufficiently cool, these crucibles were dumped on a grating, the unconverted mixture going through the grates to a recovery storage bin, and the ingot taken to a clearing room. Here the crust or scale was removed with axes or pneumatic tools. This process was unsatisfactory from the standpoint of uniform quality. Much lime and coal surrounding the ingot were unconverted, and, therefore, had to be rehandled. A considerable quantity of coal was burned in dumping the pots, necessitating further addition of coal before the mixture could be used again. In practice 4 tons of raw material were handled to make 1 ton of carbide. The ingot itself varied from almost pure carbide in the center, to an outside layer of melted lime and coal which had not become sufficiently hot to be converted into carbide. The removal of this outside layer was often difficult, and frequently the crust was found in the carbide, causing much dissatisfaction.

At this stage, American makers began to use a very ingenious furnace to offset these difficulties. This is known as the Horry rotary furnace, and, while still adhering to the ingot principle, it has been so perfected, both in operation and efficiency, that it competes successfully with any other process. The body of the furnace is formed like a spool, with wide flanges fastened to the drum, thus forming with it three sides of a square if viewed in cross section. The fourth side is formed by removable plates, which are clamped across the ends of the sides or flange plates by bolts or clamps. Two electrodes, suspended from above, hang vertically in this square space. There is no electrical connection to the furnace itself, the current passing from one electrode to the bath of carbide, and through the carbide to the second electrode, These furnaces are known as 2 electrode, single-phase, and use a current of about 4,000 amperes at 75 to 80 volts. In operating them, a small quantity of broken coke or carbon is placed under the electrodes, the arc sprung, and the charge of lime and coal fed in until the arcs are well covered up. The electrodes themselves are fixed, the regulation being accomplished by slowly revolving the drum away from the arc as the carbide accumulates in a pool beneath the electrodes. This regulation is automatic, being controlled by a relay which engages a pawl to increase or decrease the current by revolving the furnace to the right or left. The revolution of the furnaces is very slow, the movement at the circumference being about 6 inches per hour.

The ingot so formed passes slowly downwards from the electrodes under the axle of the furnaces and upwards at the back. The end plates are unbolted and the carbide ingot exposed. Holes are drilled across the ingot by air drills with water cooled points, the water cooling the carbide and slaking it in front of the drill. Into the holes so formed, wedges are driven and a section of the ingot broken off, and carried away by a crane to the cooling room.

The operation of these furnaces is continuous during the life of the electrodes, which, being kept well buried in the charge, are consumed very slowly. The actual fusion of the carbide extends very close to the cast iron sides of the furnaces, thus minimizing the quantity of unconverted charge and crust.

Two other electrode furnaces, having a crucible instead of the revolving wheel, are in use. These differ in principle from the rotary furnaces only in not being continuous, the crucibles being changed when full, and new ones substituted every 10 or 12 hours.

In Europe the early pot furnaces of the ingot type were slowly changed to tapping furnaces, in which the carb ide is run out in the molten state into cast iron moulds. The type of furnace used was much the same as the ingot pot furnaces, with a sing le electrode suspended in the center of the pot, which latter was lined at the bottom with carbon and provided with a suitable connection to the other side of the circuit. One of the greatest difficulties encountered was in keeping the carbide at a temperature at which it could run readily from the furnace. To meet this a flux of lime was added which increased the fluidity, but somewhat reduced the quality of the carbide.

With the developments of larger transformers larger furnaces were built, and skill in tapping the furnaces played no small part in their ultimate success. At the present time, carbide is tapped easily at the highest temperature, and the grade so made is fully eq ual to the best ingot product.

Later developments in tapping furnaces tend towards two or three electrodes suspended vertically in the furnace, using two or three phase current to distribute the load more equally to suit the necessities of the generating plants. Such furnaces can be built to sizes of 2,000 to 3,000 horse power, with great economy gained from the labor and power standpoint.

The manufacture of suitable furnace electrodes has been the deciding factor in many cases. Often manufacturers of carbide were unable to use furnaces because no satisfactory electrodes coul d be had. In 1892 the only satisfactory electrode made in the United States was 4 inches square, and would carry about 500 amperes. To-day, electrodes 18 inches to 22 inches are in the market, which are satisf actory and reliable. Electrodes made by assembling a number of 8-inch diameter units in parallel in a single head or holder, have been in successful use at Shawinigan Falls for a number of years. Currents up to 40,000 amperes are occasionally used, with 25,000 to 30,000 amperes the average load.

Whether the carbide is made by the ingot or tapped process, its subsequent treatment is much the same. The problem of crushing and sizing is one of the successive reductions through crushers and rolls, making the least possible dust. Ingot carbide has a natural tendency to break into cubes on account of its crystalline structure caused by slow cooling of the ingots. Tapped carbide, on the contrary, is cast at approximately 2,500° C. into a heavy cast iron chill, and is consequently close grained and dense. It is much harder to break and requires very heavy machinery. For granulations of carbide to sizes of ¼ inch to ½-inch, low speed rolls are used, as they yield the minimum amount of dust. The sizing is usually done on trommels or rotary screens, which deliver the product in sizes varying from large lumps, 8 inches by 4 inches, to fine materials, 16 by 30 mesh, suitable for a small table lamp.

A can making plant is a necessary part of every works. The standard packages in use hold 100 pounds, 110 pounds and 220 pounds, net weight, of carbide. Small tins of from 1 to 25 pounds are filled for automobile lamps trade, etc. All carbide exported by water is subject to rigid insurance rules, which necessitate a steel drum cased in wood. A complete installation of box and stave-making machinery is, therefore, part of the equipment of an export works.

The largest use for carbide is in the generation of acetylene for lighting purposes. The oxy-acetylene blowpipe is becoming a common tool in well-equipped shops, and, in the hands of skilled operators, gives great economy in repairing broken parts and in cutting away unnecessary metal. The cyanamide industry in Europe is believed to be on a sound financial basis, and is now using thousands of tons annually.

Our Enormous Junk Heap.

A late issue of the "Press Bulletin" of the U. S. Geological Survey says that the value of the secondary metals, exclusive of gold, silver, platinum, iron and aluminum, recovered in 1912, reached the enormous total of $77,395,843.

Secondary metals are those recovered from scrap metal, sweepings, skimmings, drosses, etc., and are so called to distinguish them from the metals derived from ore. Figures showing the recovery of secondary copper, lead, zinc, tin and antimony are summarized in the table below.

The values given for them are arbitrary, based on the approximate average value of the primary metal for the year. While junk dealers and collectors pay but low prices for small quantities of scrap metals,

competition brings good prices for carefully sorted scrap sold in large quantities. After remelting or refining, they are sold at only slightly lower prices than new metal. These secondary metals displace an equivalent quantity of primary metals, and must be considered in estimates of stocks available for consumption in any year. A few special purposes require especial purity of material, and employ primary or virgin pig metal, but as a general rule, secondary metals can be used in whole or in part. Most foundries, to compete for business must use secondary material in part; and scrap metal is purchased by them and remelted with primary pig metal or with composition ingot. The secondary smelters, by handling large quantities of all kinds of scrap, are able to classify their material, and produce alloy metals of uniform composition. Such composition ingots are being purchased and used in increasing quantities by foundries and other manufacturers, in place of primary metals or mixtures of new and scrap metals. The higher prices in 1912 for all metals other than lead, caused more than a normally increased demand for metals from scraps, drosses, etc.

There is a notable increase in the use of magnetic separators to scrap from iron filings, and at some plants concentrating tables are used by which cinders and molding sand from brass foundries containing as little as 2 per cent. of metal, are treated successfully.

At least 37,500 tons of copper were recovered from clean scrap made in the course of manufacture of copper and brass ware, so that only about 107,000 tons were obtained from ashes, cinders and scrap, or from material that had actually been used and discarded. According to the Bureau of Foreign and Domestic Commerce, the exports of scrap brass, fit only for manufacture, were 14,435 tons, and the imports were 3,298 tons. While many railways sell their brass and copper scrap to dealers the reports received show that the railways utilized in their own shops and foundries over 12,900 tons of brass, in addition to 1,557 tons of copper, and 1,813 tons of copper in alloys other than brass. The production of copper from secondary sources in 1912 was equal to 17.5 per cent. of the smelter output of primary copper or 22.3 per cent. of the primary copper smelted from domestic ores.

The recovery of lead in alloys was very large, increasing over 10,000 tons compared with 1911. This increase was mainly the result of the prevailing high prices for the other metals in the alloys, and of expansion in manufacturing which occasioned a more extensive use of remelted babbitt and bearing metals. Other important sources of secondary lead were old pipe, lead linings of acid tanks, and drosses from white-metal alloys. Regular smelters reported the recovery of 7,385 tons of lead from lead and antimonial lead scrap. The total output of secondary lead was equal to 13.3 per cent. of the refined lead produced.

The output of secondary zinc (including that in brass) amounted to 81,543 tons and equaled 24.1 per cent. of the total production of primary spelter. The zinc recovered in alloys other than brass amounted to 3,912 tons. Of the 52,251 tons of secondary zinc recovered as spelter, 26,064 tons were obtained by redistillation from drosses, skimmings, etc. In addition to the large quantity of spelter recovered, several thousand tons of zinc chloride was made from drosses, and likewise several thousand tons of the zinc pigment, lithopone.

Two zinc smelters in the Eastern States which recover spelter from drosses, skimmings, etc., used 1,000 pound retorts, instead of the small ones used by smelters treating ore or mixed ore and drosses. A large portion of the secondary spelter recovered was above 99 per cent. pure, and equal in every respect to spelter from ore.

The production of secondary antimony, of which all but 13 tons were recovered in alloys, was 2,506 tons. No antimony ores of domestic origin were smelted in 1912, but the total for the year includes 135 tons of antimony contained in antimonial lead scrap recovered by regular smelters. The principal materials refined or remelted which contained antimony as an alloy, were hard lead drosses, babbitt, solder, pewter and type metal. The 1912 imports of antimony as metal, in ore, or oxide, amounted to 8,685 tons, and the recovery from secondary sources was equal to 29 per cent. of such imports. The secondary recoveries of antimony were double those of the antimony content of antimonial lead ores of domestic origin smelted in 1912.

No domestic tin ores were smelted in 1912, though some tin concentrates were shipped from Alaska to England, and a small quantity of foreign ore was smelted in New York. This condition makes secondary tin an important factor in supplying domestic consumption. The tin recovered in 1912 was equal to 26.6 per cent. of the tin, as metal or as oxide imported during the year.

The recovered tin includes the tin content of products made from tin scrap. These include some tin oxide, putty powders, etc., but consist mainly of tin chloride. The production of these compounds is calculated as metal.

As these products are made from scrap tin, and thus conserve the primary metal, they are properly regarded as recovered tin. Two forms of tin chloride are handled commercially—stannic and stannous salts. Stannic chloride is sold either as a water solution, called bichloride of tin, or as an anhydrous sirupy liquid, termed tetrachloride, and is used principally in the silk industry. Stannous chloride is sold in the form of crystals and is used in dyeing and calico printing.

Most of the tin oxide, tetrachloride and other products were made from clean tin-plate clippings, or from tin liquors left in dyeing or weighting silks. The dry chlorine process is used to recover the tin from the clippings. Reverberatory furnaces are used to remove the tin coating, and a large quantity of tin is recovered in the form of powder by electrolytic treatment of clean scrap. The largest recoveries of tin were from the scruff and drosses that occur in making tin and terne plate, and amounted to over 5,000 tons. The recovery of tin from block tin pipe, tin foil and old tin cans was relatively small. Only one firm reported using old tin containers, from which the tin and solder are sweated, and the black plate melted for sash weights. Two years of high prices have failed to bring about any increase in the recovery from used tin cans, and there seems to be no present prospect of any conservation of this large quantity of tin that now goes to the dump.

The principal alloys in which secondary tin is recovered were bearing metals, bronze, solder, pewter and electrotype metal.

Production of Secondary Metals in the United States in 1912.

Metal.	Short Tons.	Value.
Secondary copper, including that in alloys other than brass	66,441	$21,593,325
Remelted brass	101,523	27,279,516
Secondary lead	30,266	6,045,120
Recovered lead in alloys	36,902	
Secondary spelter	52,251	7,750,494
Recovered zinc in alloys other than brass	3,912	
Secondary tin	8,333	14,301,368
Recovered tin in alloys	7,068	
Secondary antimony	13	426,020
Recovered antimony in alloys	2,493	
Total value	....	77,395,843

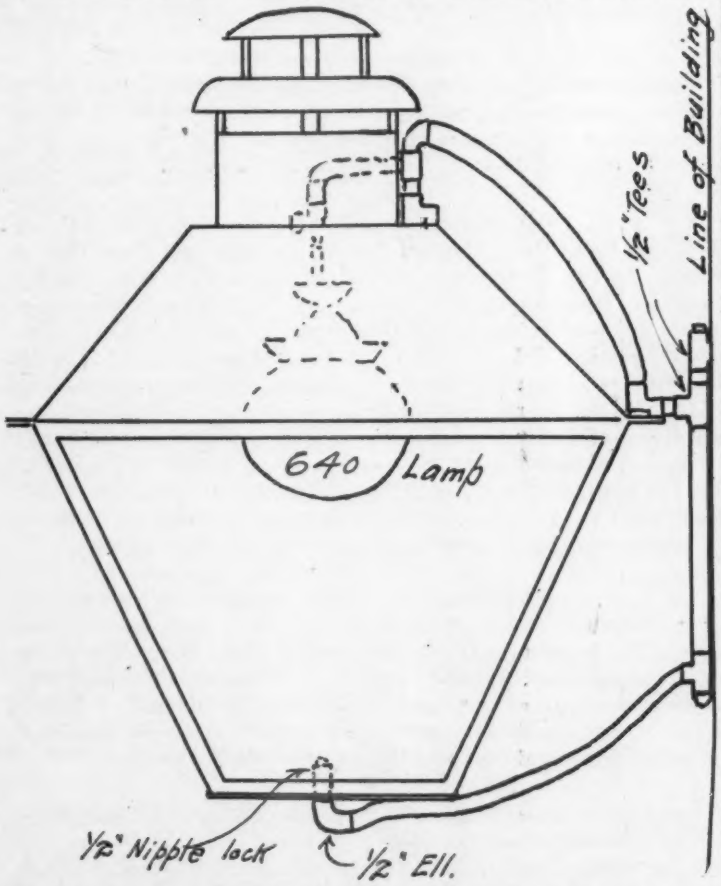
New Methods and Appliances.

Domestic Science Equipment.—The Eclipse Gas Stove Company believes in designing a special form of appliance to meet each special new demand. The unit illustrated is its latest production, designed for the equipment of domestic science rooms in school buildings.

The top of this cabinet, or table, is of wood, and the balance of the construction is sheet metal, enamelled a beautiful white. As illustrated, the cabinet contains 5 roomy drawers, and 4 handy working shelves which slide under the top when not in use. An ordinary wooden cabinet costs from $3 to $4 per running foot when built to

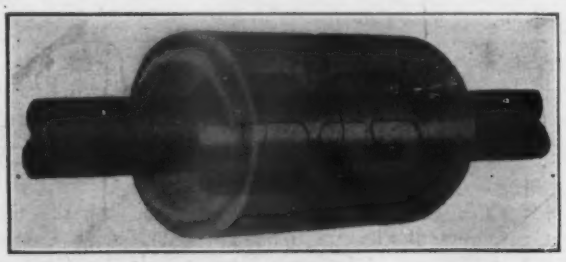
order, but this new cabinet, which is unquestionably better, both from a sanitary and artistic viewpoints, can be supplied for $15. The top surface measures 60 inches, by 24 inches deep, and is 32 inches high. The price quoted ($15) is for the cabinet only. The price of the 2-pupil, diet stove shown on top of cabinet is $4, and the ovens $1 each. Duplicates of this unit can be used to form any size equipment required.

EXTERIOR LIGHT FOR A BARBER'S SHOP.—Mr. W. H. Matlack, Jr., incloses the accompanying rough sketch of an outside light in lantern,



which he rigged up for a local barber, who has his gas supply from the mains of the Henrico County (Barton Heights) Gas Company, of Virginia. As Mr. Matlack suggests, "The sketch tells the story."

A NEW LINE SHAFT COUPLING.—The Bull Dog Shaft Coupling shown in this cut is a device that will join the ends of two shafts,



without keys, cones, or bolts, or cutting of the shaft for keyways. It consists of but a cylinder or sleeve and an internal roller-locking device. The ends of the shaft to be joined are simply slipped into the cylinder and a quarter turn of the sleeve locks it in position on both the ends. It can be just as easily removed if desired, and this ease of application makes it valuable as an emergency device for repairs, as well as a reliable permanent fixture.

CANDLE POWER REQUIREMENTS IN RULES PROMULGATED BY THE INDIANA PUBLIC SERVICE COMMISSION.—The Indiana Public Service Commission has issued the following order:

In obedience to the command of the statute, the Commission has prescribed for every corporation, company, individual, association of individuals, their lessees, trustees or receivers appointed by any court whatsoever, and every city or town that now or hereafter may own, operate, manage or control any plant or equipment within the State of Indiana, for the production, transmission, delivering or furnishing of gas or electricity for heat, light or power, the following rules and regulations, to wit:

Rule 1.—A meter may be considered as correct if, when passing gas at the rate of 6 cubic feet per hour per light capacity, it shows, in comparison with a standard gas prover, an error which is not greater than 2 per cent.

Rule 2.—No gas company shall allow a gas meter to remain in service for a period longer than 3 years without checking it for accuracy and readjusting it if found to be inaccurate.

Rule 3.—Each company shall keep a complete record of tests made on meters before installation and upon receiving them from the services.

Rule 4.—Each gas company shall provide itself with equipment necessary for testing meters, such equipment to consist of a standard meter prover with suitable accessories.

Rule 5.—Each gas company shall make a test of the accuracy of a meter upon request of a consumer, provided such consumer does not make a request for test more frequently than once in 6 months. A report giving the results of such tests shall be made to the consumer and a complete record of such test shall be kept on file in the office of the company.

Rule 6.—Upon formal application of any consumer to the Public Service Commission a test shall be made upon the consumer's meter by an inspector employed by the Public Service Commission, such test to be made as soon as practicable after receipt of the application. For such test a fee of $2 shall be paid by the consumer making application for the test if the meter is found to be slow or correct within the allowable limit, and by the company owning the meter if the meter is found to be fast beyond the allowable limit.

Rule 7.—Meter dials shall read directly in cubic feet of gas, and bills rendered periodically by the company shall designate the readings of the meter at the beginning and end of the time for which the bill is rendered, and give the dates at which the readings were taken.

Rule 8.—The company furnishing gas which, within a 1-mile radius from the distributing center, gives a monthly average total heating value of not less than 600 B.T.U., with a minimum which shall never fall below 550 B.T.U., may be considered as giving adequate service as far as the heating value of the gas is concerned.

Rule 9 —Each gas company, whose output exceeds 20,000,000 cubic feet a year, shall equip itself with a standard calorimeter outfit, with which periodic tests upon the gas shall be made. A record of these tests shall be made and kept open for public inspection.

Rule 10.—Gas pressure, as measured at meter inlets, shall never be less than 1½ inches nor more than 6 inches of water pressure; and the daily variation of pressure at the inlet of any one meter on the system shall never be greater than 100 per cent. of the minimum pressure.

Rule 11.—Each company shall make frequent measurements of the pressure and pressure variations, and these shall be kept on record and open for inspection by any user of the service of the company.

Rule 12.—In no case shall the gas contain more than 30 grains of total sulphur per 100 cubic feet and not more than a trace of sulphur as sulphureted hydrogen.

Rule 13.—Each company shall keep a record of complaints, which shall include the name and address of the consumer, the date, the nature of the complaint and the remedy. A classified summary of these records shall be submitted to the Commission on or before the 28th day of each month for the preceding month.

Rule 14.—No electric meter which registers upon "no load" shall be placed in service or allowed to remain in service.

Rule 15.—No electric meter shall be placed in service or allowed to remain in service which has an error of registration in excess of 4 per cent. on light load, half load or full load.

Rule 16.—Each electric service meter shall be tested and adjusted for accuracy at the time of its installation.

Rule 17.—Each electric service meter shall be tested at least once each year, the test to be made by comparing the meter while connected in its place of service with suitable standards, on light load, half load and full load rate of operation.

Rule 18.—A complete record shall be kept of all tests made on electric meters.

Rule 19.—Each company supplying electric energy shall provide itself with suitable equipment for the testing of meters, and shall employ such methods as are approved by the Public Service Commission.

Rule 20.—Each company supplying electrical energy shall make a test of the accuracy of a meter upon request of a consumer, provided such consumer does not make request for tests more frequently than once in 6 months. A report giving the results of such tests shall be made to the consumer, and a complete record of the same shall be kept on file in the office of the company.

Rule 21.—Upon formal application of any consumer to the Public Service Commission a test shall be made upon the consumer's meter by an inspector employed by the Public Service Commission, such test to be made as soon as practicable after the receipt of the application. For such test a fee of $2 shall be paid by the consumer making application for the test if the meter is found to be slow or correct within the allowable limit, and by the company owning the meter if the meter is found to be fast beyond the allowable limit.

Rule 22.—Each company supplying electrical energy shall maintain a record of all interruptions of service upon the entire system or major divisions of the system, and include in such record time, duration and cause of each interruption.

Rule 23.—Each company supplying electrical energy on constant potential systems shall adopt and maintain a standard average value of voltage as measure at any consumer's cutout, which shall remain constant from day to day, and varying during any one day by an amount not more than 6 per cent. of the minimum value.

Rule 24.—Each company supplying electrical energy for incandescent illumination shall adopt and maintain some method of procedure which will insure periodic inspection of incandescent lamps to which current is supplied, and under which the company will render its consumers assistance in securing incandescent lamps best adapted to the operation of the system. Each company shall submit to the Public Service Commission of Indiana the details of such methods of procedure as it may adopt.

Rule 25.—Each company supplying electrical energy for incandescent illumination shall specifically inform each of its consumers as to the conditions under which efficient illuminating service may be secured from its system.

"The foregoing rules," says the Commission, "are in force in a number of the States of the Union. Our attention has been called to no State that very materially departs from such rules and regulations.

"In the preparation of the above and foregoing the Commission was assisted by Mr. Forrest of the Citizens Gas Company, and Mr. Carl H. Graf of the Indianapolis Gas Company, both of Indianapolis; by Prof. White, of the Rose Polytechnic Institute; by Prof. Mathers, of Indiana University; by Prof. Harding, of Purdue University, and by B. S. McBride, Bureau of Standards, Washington, D. C. To each of these gentlemen the Commission desires to accord its appreciation of their labors. The rules and regulations prescribed are practically the same as those prescribed by the Railroad Commission of Wisconsin." Rule 6 is the only one that has given the Commission any embarrassment. The high quality of the gas heretofore produced by each of the Indianapolis gas companies is perhaps above the standard of the companies of the State. The Commission has the same power that the Legislature has, and may prescribe rules and regulations for the government of gas companies for cities of more than 100,000, and another rule for the remainder of the State, but after consideration it is believed that a standard of 600 B. T. U. will be sufficient to maintain the quality of the gas as high as that heretofore produced by the Indianapolis companies. Should tests hereafter made show that the quality of the gas produced by the Indianapolis companies was being lowered below what it now is, the Commission would have power at any time to change, alter or modify the rule regulating the number of B. T. U.'s in each 1,000 cubic feet of gas, and it will not hesitate to do so. It is not the intention of the Commission to permit the quality of the gas hereafter to be produced to be materially lowered in the future.

It is therefore, ordered by the Public Service Commission of Indiana, that the above and foregoing rules and regulations are hereby prescribed as the rules and regulations touching the quality, initial voltage, etc., of each and every gas and electric utility in the State of Indiana.

Items of Interest
FROM VARIOUS LOCALITIES.

Mr. John S. Unger is installing an ammonia concentrating apparatus in the new works of the La Crosse (Wis.) Gas and Electric Company.

Some time ago the Queens Borough Gas and Electric Company forwarded a $100 check to the Kings County (Brooklyn, N.Y.) Firemen's Hospital bed fund, as a recognition of the excellent work accomplished by the firemen during a conflagration close to the Company's business headquarters, Far Rockaway, Long Island.

The chemistry class of the Teachers' College, Cedar Falls, Ia., recently visited the plant of the Citizens Gas and Electric Light Company, of that city, and were escorted through the works. The successive steps in the production of gas and electric currents were described and explained to them by Messrs. Craig and Smith. The party was under the direction of the teacher, Prof. G atchell.

The Hampton, Phœbus and Fort Monroe Gas Corporation, by vote of Hampton City Council, has been granted permission to remove its plant from Hampton to Newport News. The rate hereafter for gas in the Hampton districts will be $1.25 per 1,000 cubic feet, instead of $1.50, as before.

The fraternity is requested to report any information that may be obtained in any way respecting the whereabouts of Mr. A. Aberg, Superintendent of Construction, the Racine (Wis.) Gas light Company, forwarding the same forthwith to the latter.

"B. A. R.," writing from Troy, N. Y., under date of the 29th ult., says that Judge Hale, Counsel for the Second New York District, Public Service Commission, and Mr. Guinne, of Messrs. Hatch & Sheehan, representing the Cooperstown (N. Y.) Gas Company, recently appeared before Justice Hasbrouck, in special term, Supreme Court, Albany, N. Y. in respect of the proceeding brought by the Commission against the Company, obliging the latter to continue a gas supply to the residents of Cooperstown. In open court the respective parties stipulated that proceedings would not be continued if defendant continued a gas service up to and including the 5th September; in addition, that it would then surrender its franchise, in pursuance of the governing statutes, thus permitting the village of Cooperstown to issue a gas franchi e to another corporation.

"L. L. S.," writing from Lynn, Mass., under date of the 30th July, says: "The Lakeside M. E. Church held a lawn party, on the pretty grounds in front of the edifice, the evening of the 29th. The attendance was excellent, and the comfort and pleasure of those present were much enhanced or heightened by means of the really beautiful illumination furnished and maintained by the courtesy and generosity of the proprietors of the Lynn Gas and Electric Company.

Pursuant to a decree issued in the instance of an action maintained by the Continental and Commercial National Bank, before the U. S. District Court (Massachusetts) against the Searchlight Gas Company, all the assets of the latter will be sold at public auction (noon, the 14th inst.), on the premises of the defendant, in Warren, O. Further information respecting this transaction may be obtained from the Receiver, Mr. A. B. Pearson, Karpen Building, Chicago.

East Grand Rapids, Mich., has appealed for an extension of gas mains to the named place from the distri bution system of the Grand Bapids Gas Light Company.

The authorities of Boston, Mass., have agreed to an extension of the contract (for 6 months, from August 1st) whereby it will light the public lamps of the city as a sub-contractor of the Consolidated Gas Company.

At the annual meeting of the Consolidated Gas Company, of New Jersey, held in Long Branch, N. J., some time ago, the following executive management was chosen: Directors, Messrs. Emerson McMillin, C. N. Jelliffe, A. P. Lathrop, Marion McMillin, Gustave Moss, Jacob Steinbach, Fred. W. Hope, Fred. M. McCutcheon and William Foster; President, Alanson P. Lathrop; Vice-President, W. Foster; Treasurer, C. Henry Irwin; Secretary, Henry E. McKaig.

In all probability the ordinance adopted January 22, 1907, which was to govern the operation of the Chattanooga (Tenn.) Gas Company for a period of 25 years, will be extended for an additional period of 25 years. This would give it life until 1953. Under it the Company will pay the city $5,000 on January 22, 1918, and $5,000 is to be paid annually thereafter. Section 5 of the agreement provides that, "In payment for such franchise, the Company, its successors and assigns, shall furnish, install, maintain and keep in repair, at its own expense, mantle, boulevard lamp posts, with incandescent burners, of like style and design of the posts now erected on Palmetto street, between McCallie avenue and Vine street, or of such other design as may be accepted by the Commissioner of Public Utilities,

Grounds and Buildings. Each of the lights shall have 150 actual candle power, and each post shall be painted at least once each year. The Company shall furnish all supplies necessary for the use and operation of the posts for lighting purposes. The lights on each of the said posts must be kept burning 3,650 hours during the year; and for each light the Company will be credited with the sum of $28 per year on the compensation payable under the ordinance." Section 7 declares that 30 days after the passage of the ordinance the Commissioner of Public Utilities, Grounds, etc., shall designate in writing the places in which the Company shall place 125 of the lights and posts, as designated. When the lights are installed and in operation, it is provided that the Company shall have paid in cash that proportion of $300,000, the compensation fixed for the current year, its obligation to pay said compensation in cash shall cease, except as provided in the ordinance.

SOME time ago an over-zealous inspector of the Standard (N. Y.) Gas Light Company entered the premises of Mrs. Catherine Burke, and removed from her apartments a gas range which had been fully paid for on the installment plan. The range at the time, as to its ovens, contained a big, fat goose, also a 14-pound cake, which viands were being "done" to figure as the main complements of the wedding feast of the Burke daughter, who was to be married the next day. The men dumped the "viands" on the floor of the kitchen and "removed" the range. A mistake had been made; 'twas a two-family dwelling, and the other occupants were the ones in arrears. However, the men's action was as aforesaid, and the substitute wedding feast had to be hastily garnered and gathered from the neighboring delicatessen. "After the dinner was over," Mrs. Burke sought legal redress; the case was tried; and Judge Wauhope Lynn, in the First District Municipal Court, rendered judgment in her favor for $75. Those interested might do well to have Judge Lynn's Clerk furnish them with a copy of the decision, which is about as clear an exposition of the "peculiar merits of the case" as could well be imagined.

THE plant of the South Delaware Gas Company, Seaford, Del., will be sold at receiver's sale at noon of the 9th prox.

AT a special meeting of the Camden (N. J.) City Council the main matter for consideration was whether or not the city should engage in the construction and operation of a lighting plant on municipal account. The unfavorable action followed the reception of an adverse report submitted by an expert, and the following vigorous opposing statement submitted by the Camden Board of Trade:

"*First.*—Because the city can purchase light cheaper than it can manufacture it.

"*Second.*—Because the city cannot successfully operate an electric plant for commercial lighting in competition with a private company.

"*Third.*—Because it is essential to keep the number of city employees down to the minimum to obtain the best administration of the city's affairs."

IN connection with the various reports submitted, it was shown that the initial plant cost would be well in excess of $500,000.

ADVICES by way of Philadelphia, dated the 31st ult., are to this effect: "The Public Service Gas Company, of New Jersey, appealed to day from the decision of the Supreme Court upholding the Board of Public Utility Commissioners, who had ordered the putting into effect of a 90-cent gas rate in the Passaic district. The appeal is equivalent to transferring the case to the Court of Errors and Appeals, where it will be argued during the November term. The Company denies the justice of the findings in several particulars. It avers that the valuation ($4,750,000) placed upon its property is insufficient; that the Board disregarded important elements of value, such as franchises and special franchises of certain corporation integers; that it considered illegal evidence regarding the value of the property; that the order is in contravention of the Constitution of the United States and of the State, in that the actual effect of the order is to seize property without just compensation."

IN the statement filed by Mr. George A. Stiness, Treasurer, the Pawtucket (R. I.) Gas Company, the gross earnings of the corporation, to June 30th, 1913, are returned at $56,998.77, which involved a payment to the city on royalty account (2 per cent.) of $1,140. Last year, on like account, that gross was $49,491 for the corresponding period.

THE State Board of Gas and Electric Light Commissioners, of Massachusetts, has ordered that hereafter the net price that the Edison Electric Illuminating Company, Brockton, Mass., may charge for a supply of current shall not exceed 12 cents per kilowatt-hour. And the reduced rate would seem quite a liberal one.

THE authorities of Lake Charles (La.) are still figuring on the possibilities of inducing someone to construct a gas plant at the named place.

ON the 12th inst. (in fact, to-morrow) the shareholders in the Blackstone Valley (R. I.) Gas and Electric Company, in special meeting will consider the advisability of a proposal to increase the common and preferred stock, each in the gross sum of $250,000.

THE proprietors of the New Bedford (Mass.) Gas and Edison Light Company, have about completed the piping of the outlying districts known as Dartmouth and Cove Village.

THE New Orleans (La.) Gas Light Company has determined to extend its distributing system to and through the St. Bernard district.

THE design and construction of the new gas manufacturing and distribution system, to be installed this year at Laurel, Miss., has been intrusted to Mr. H. I. Lea, Consulting and Constructing Gas Engineer, Chicago. Plans and specifications are now being prepared, and bids will be requested by Mr. Lea, probably within the next two weeks. The financing of this project is being done by the General Service Corporation, of Philadelphia.

CONTRARY to prevailing opinion respecting business conditions throughout the country, some manufacturers are almost overwhelmed with orders; and this applies to those connected with the constructing division of the gas industry. The Terry Steam Turbine Company, Hartford, Conn., has just commenced operating on a 23-hour per day basis, the one hour of idleness being from 6 to 7 A.M. It was found necessary to do this in order to clear the shop from its present crowded condition, due to congestion of orders during the past few months. June is reported to have been the busiest month ever enjoyed by the Company.

MR. B. C. ADAMS, Manager of the Lincoln (Neb.) Gas Company since 1909, has been appointed General Manager of the Spokane (Wash.) Gas and Fuel Company. His successor at Lincoln is Mr. G. A. Montgomery, who has been Superinten dent of the plant for something over a year.

MR. BEMAN G. DAWES, at a special meeting of the Directors of the Columbus (O.) Gas and Fuel Company, was elected President of that corporation, succeeding Mr. H. D. Turney, who had filled the place temporarily, or until his successor could be chosen. It is needless to say that Mr. Dawes is the right man for the place, and his good business ways, always pleasing personality and complete knowledge of the oddities of the situation may be safely counted on to straighten out the Columbus gas tangle, which certainly has been an involved one for some time.

AT the organization meeting of the Directors of the Lansing (Mich.) Fuel and Gas Company, this executive management was named: President, C. H. Geist; Vice-President, C. H. Weak; Treasurer, B. F. Davis; Secretary, J. W. Parmelee.

REEDLEY (CAL.) is to have a gas plant. The name of the corporation is the Alta Gas Company, and Mr. A. A. Weber is its President. It is agreed that the selling rate shall not exceed $1.25 per 1,000 cubic feet; the franchise life is 30 years; and the city is to receive (after the first 5 years of plant operation) 2 per cent. of the gross receipts per annum. These people are the ones who recently built and put in successful operation the gas works at Dinuba, Cal.

AT the annual meeting of the Fall River (Mass.) Gas Works Company the officers elected were: Directors, Alfred D. Foster, Fred. P. Royce, Gardiner M. Lane, E. S. Webster, Phillip Dexter, G. C. Lee, Jr., Chas. F. Prichard, R. Robb; President, Frederick P. Royce; Vice-President, Geo. P. Brown; Treasurer, Henry P. Sawyer; Clerk, Wm. T. Crawford.

MR. RICHARD CHAMPION has resigned from the staff of the Old Colony (Mass.) Gas Company, to accept a responsible position with the Edison Gas and Electric Company, New Bedford, Mass.

The Market FOR GAS SECURITIES.

There was a good share of animation last week in city gas share trading, and several turnovers in bond issues are reported. Consolidated came in this morning (Friday) with sales at 132¾, and at noon that figure was bid for 300 shares, or any part thereof. A large fire insurance company took in 250 shares of the stock early in the week for investment surplus account. In connection with the engineering division of this great Company, the writer cannot forbear from writing down a line or two respecting an exclamation by an important member of the editorial staff of an influential New York daily. The conversation was in connection with the magnitude of the recent tunnel work. Your scribe dilated on the dangers and perplexities of the undertaking, and quite naturally emphasized the skill of the men who designed and carried on the undertaking—the rank-and-file, from the veteran Chief Bradley down. Before the exordium had been completed, Mr. Editor broke in with this: "You don't mean to say that the Consolidated Gas Company's engineers were responsible for this great work!" And there you are. The local situation looks good from every angle.

Brooklyn Union is a trifle firmer, and in due time some of the Wall street wind jammers will find out the intrinsic value of these shares. Peoples, of Chicago, maintains its recent advance, and Lacledes are something steadier, but still ridiculously low. The regular 1¾ per cent. on Peoples, of Chicago, is payable the 25th inst., and the quarterly of 2 on Blackstone Valley Gas and Electric (R. I.) is payable next Saturday.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

AUGUST 11.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par alue of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$99,816,500	100	132¾	133
Central Union Gas Co.—				
1st 5's, due 1927, J. & J.	3,500,000	1,000	101	103
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,600,000	100	157	157
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	99	101
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	59	62
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	96	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	102
Standard	5,000,000	100	102	104
Preferred	5,000,000	100	93	94
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	91	93
The Brooklyn Union	15,000,000	1,000	128	130
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	83	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	95
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	106¼
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75½	80
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	85	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	130	133
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	7	90
" Bonds, 5's	2,650,000	—	90	93
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	200,000	1,000	97	100
Cincinnati Gas and Electric				
Co.	29,500,000	100	87	90
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	96½	99
Laclede Gas Co., St. Louis.	10,000,000	100	96¾	97
Preferred	2,500,000	100	—	102½
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	120	120
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Compan-				
ies, of Boston	35,000,000	100	90½	91
Preferred	25,000,000	100	90½	—
Montreal L. H.& P., Canada	2,000,000	100	103	104
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	189	190
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	114½	115
1st Mortgage	20,100,000	1,000	103	103½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
Pacific Gas and Electric Co.	15,500,000	—	40½	41
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
United Gas Imp. Co.	55,502,960	50	170	175
Washington (D. C.) Gas Co.	1,800,000	200	450	460
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, Richmond, Va., October 15-17, 1913. Officers: President, W. R. Addicks, New York City. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting Sept. 1913. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 8, 1913. Officers: President, C. G. M. Thomas, Long Island City, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

Gas Meters.—Monthly Section Meetings; Grand Commissioner, I. W. Peffly, New York; Gen'l Sec'y, H Thurston Owens, La Crosse, Wis.; New York Section, Chairman, W. H. Pettes; Secretary, G. E. Smith, Sipp Avenue, Jersey City, N. J. Philadelphia Section; Chairman, L. R. Dutton; Secretary, H. F. Patterson, Jr., 833 Chestnut street. Cleveland Section, Chairman, F. R. Hutchinson; Secretary, Wm. Holtz, East Ohio Gas Co. New England Section, Chairman, T. W. Jennings, Boston; Sec., F. K. Wells, 60 Broad street, Boston. Winona Section, Winona, Minn., W. F. Clausen, Chairman.

Guild of Gas Managers of New England.—Annual meeting, March, 1914 Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 18th and 19th, 1914. Chicago, Ills. Officers: President, W. F. Barrett, Chicago, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, ——— September, 1913. Meetings of Sections, monthly. Pres., Preston S. Millar; General Secretary, J. D. Israel, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March —— —— 1914. Terre Haute. Officers: President, A. S. Cooke, Terre Haute; Vice-President, A. C. Blinn, Evansville; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, May, 1914; ——— Officers: President, B. C. Adams, Lincoln, Neb.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October —— 1913. ——— Officers: President, L. O. Ripley, Emporia, Kas.; Secretary and Treasurer, W. H. Fellows, Leavenworth, Kas.

Michigan Gas Association—Annual meeting, September, 17, 18, 19, 1913; ——— Officers: President, W. S. Blauvelt, Detroit, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Mexico, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and gas show, Dec. 1-6, 1913. Philadelphia, Pa. Officers: President, C. W. Hare, Philadelphia Pa.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, St. Louis, Mo., May 19 and 20, 1914: Officers: President, E. L. Brundrett, Kansas City, Mo.; Secy-Treas., T. Clive Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, 18th and 19th, 1914, Boston. Officers: President, T. H. Hintze, Providence, R. I.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Annual Meeting. July —, 1913, Asbury Park N. J. President, C. F. Butcher, Freehold, N. J.; Sec'y-Treasurer, O. F. Potter, Newark, N. J.

Ohio Gas Association.—Annual meeting, February ——— 1914, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, Oklahoma City, May, ——1914. President, F. E. Bowman, Ada; Secretary-Treasurer, H. V. Bozel, Oklahoma City.

Pacific Coast Gas Association.—Annual meeting, San Jose, Cal., September 16, 17, 18, 1913. Officers: President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, Henry Bostwick, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, Allentown, Pa., April ———, 1914; Officers, President, J. A. Frick, Allentown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 11, 1913; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, Mobile, Ala., April 4, 1914, Officers: President, James Ferrier, Rome, Ga.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. May——— 1914, Galveston, Tex. Officers: President, G. H. Gifford, Fort Worth Tex.; Secretary H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May ———1914, Milwaukee, Wis. Officers: President, Ewald Haase, Milwaukee, Wis.; Secretary-Treasurer, Henry Harnan, Milwaukee, Wis.